

SCHOOL OF AUTOMOTIVE  
MACHINISTS & TECHNOLOGY

# **SAM TECH**

SAMTECH.EDU

1911 ANTOINE DRIVE • HOUSTON, TEXAS

# 2023 SCHOOL CATALOG

VOLUME 30 EFFECTIVE 05/2023



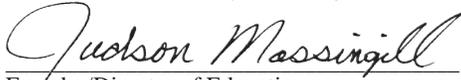
**SAM TECH STUDENTS PROJECT ON DYNO**



## TABLE OF CONTENTS

ACADEMIC STRUCTURE & GRADING .....	5	MAKE UP WORK .....	5
ADMISSION REQUIREMENTS .....	4	MINIMUM CANCELLATION POLICY .....	2
ADVISING .....	1	ORIENTATION .....	1
APPEAL/RE-ADMISSION.....	4	PHILOSOPHY & MISSION STATEMENT .....	1
APPLICATION PROCEDURES .....	3	PREVIOUS EDUCATION/TRAINING CREDIT .....	4
APPROVALS & MEMBERSHIPS.....	1	REFUND POLICY .....	2
ATTENDANCE PROCEDURES.....	4	RETURN OF TITLE IV FUNDS .....	Sup-B
AWARDS .....	5	SATISFACTORY ACADEMIC PROGRESS .....	5
CAUSES OF TERMINATION .....	4	SCHOOL CALENDAR & HOURS .....	2
CONDUCT POLICY .....	4	SCHOOL PAYMENT PLANS.....	2
COURSE OBJECTIVES & DESCRIPTIONS ...	7-16	SIZE OF CLASS/RATIO .....	5
EDUCATIONAL OBJECTIVES .....	1	STUDENT ACTIVITIES .....	2
ENROLLMENT & HOLIDAYS .....	Sup-A	STUDENT CONSUMER INFO MANUAL .....	2
FACILITIES .....	1	STUDENT EVALUATION .....	6
FACULTY .....	Sup-A	SUBJECT GRADING SYSTEM LAB/THEORY .....	5
FINANCIAL ASSISTANCE.....	2	SUPPLEMENTAL INCOME.....	2
GRADUATION.....	5	SUSPENSION .....	4
GRIEVANCES & COMPLAINTS.....	5	TARDINESS POLICY .....	4
HISTORY .....	1	TEXTBOOKS & SUPPLIES.....	2
HOUSING.....	1	TOOLS & SUPPLIES.....	2
INDIVIDUAL ASSISTANCE.....	6	TRANSCRIPTS .....	2
JOB PLACEMENT ASSISTANCE .....	2	TUITION & FEES .....	Sup-A
LEAVE OF ABSENCE.....	4	WITHDRAWAL FROM SCHOOL .....	2

The information in this catalog is true and correct to the best of my knowledge.



Founder/Director of Education

### HISTORY

The School of Automotive Machinists was the concept of Linda and Judson Massingill who had for approximately nine years trained automotive machinists for their machine shop (Northwest Engine & Supply). During this period of time many well-trained employees departed to open their own automotive machine shops. The loss of these highly skilled, well trained machinists slowed down the general production of the machine shop. To help solve this problem, Mr. and Mrs. Massingill began to take on students as apprentices; teaching them the science and skill of the automotive machinist, which led to the founding of the School in 1985. The School of Automotive Machinists was developed to fill a need and a void in the automotive industry. The initial two courses received state approval in 1989, became accredited by the Accrediting Commission of Career Schools and Colleges (ACCSC) and approved by the Department of Education in 1991. In July of 2004, final approval was received for a third course and in 2006, the School received approval for its fourth program which is a combination of the Block and Head Machining programs. In October 2012, approval was received to offer an academic associate degree. Motorsports Welding was approved in November 2014. The Motorsports EFI Tuning program was approved in November 2015. In February 2016, the School name was changed to the School of Automotive Machinists & Technology.

MM&L Corporation owns the School of Automotive Machinists & Technology and is responsible for all activities of the School.

We have established a good working relationship with many nationally known standard and high performance industry shops. Our graduates have been placed locally and nationwide in both public and private automotive machine shops.

### PHILOSOPHY & MISSION STATEMENT

The School of Automotive Machinists & Technology (SAM Tech) believes strongly in the education of the professional automotive machinist. The curriculum is structured such that it provides the student with training to meet the demands of today's work place plus job placement assistance to successfully enter the world of work. The School strives to develop and offer programs so that each student can achieve his/her goal of maximum learning in the required time while maintaining quality educational standards. Therefore, skill and knowledge should lead to job placement, satisfaction, and advancement.

SAM Tech focuses on the values of positive attitudes, ethical conduct, and proper behavior at the workplace and in relation to employers, co-workers, and the public. The purpose of the School of Automotive Machinists & Technology is to offer professional instruction that will enable the student to develop his/her educational potential and increase his/her contribution to society.

### FACILITIES

The School of Automotive Machinists & Technology has 16,000 square feet of floor space which includes spacious air-conditioned classrooms, teaching lab, educational resource center, student lounge, faculty and administrative offices. The classrooms are designed and equipped for academic instruction within the faculty-student ratio for occupational training as specified by state regulatory authorities.

The lab equipment is the same as found in a typical industry working environment (see

Equipment List Addendum). The lab provides an area for practical demonstration and hands-on experience to reinforce the academic theory.

An educational resource center is provided for use by both students and staff.

A student lounge is available for social contact during class breaks. Vending machines for light refreshments are located in the student lounge area.

Parking is available at the School's campus and additional parking is adjacent to the School.

### EDUCATIONAL OBJECTIVES

In order to accomplish this philosophy and purpose, the School of Automotive Machinists & Technology has established the following primary educational objectives:

1. To offer training and instruction in automotive technology at a superior level.
2. To provide an opportunity for a student to achieve an entry level skilled trade in the automotive field.
3. To offer an education that will enrich the student's personal life and prepare him/her for better citizenship, as well as, increase his/her employment potential.

### APPROVALS & MEMBERSHIPS

The School of Automotive Machinists & Technology is approved by, or holds memberships in, the following organizations and associations:

#### APPROVALS

1. Accrediting Commission of Career Schools and Colleges (ACCSC)
2. Texas Higher Education Coordinating Board (THECB)
3. United States Department of Education
4. Approved to train VA eligible persons through the Texas Veterans Commission, Austin, Texas
5. Texas Workforce Commission, Career Schools and Colleges (TWC-CSC)
6. Texas Department of Assistive Rehabilitative Services (DARS)
7. Texas Workforce Commission, Workforce Investment Act (TWC-WIA)

#### MEMBERSHIPS

1. Automotive Engine Rebuilders Association (AERA)
2. Texas Association of Student Financial Aid Administrators (TASFAA).
3. Automotive Parts & Services Association (APSA)
4. Specialty Equipment Manufacturing Association (SEMA)
5. Career Colleges and Schools of Texas (CCST)

#### ADVISING

All students are encouraged to seek assistance from the Director or other appropriate staff members concerning vocational decisions or any other problems that affect the student's attendance or grades in the School. Degree students are advised at least twice during the general education section.

#### ORIENTATION

The School provides a student orientation program for all new students. The program serves to acquaint the student with the School's policies and procedures, the faculty, course objectives, curriculum and other services offered by the School.

#### HOUSING

The School does not maintain a dormitory facility. However, students desiring housing

accommodations should contact the admissions department for information.

### **TRANSCRIPTS**

The School requires official transcripts or diploma from high schools and post secondary schools attended. A copy of the official GED certificate or test score is required. Students may request transcripts for completed programs at any time.

### **LEARNING RESOURCE SYSTEM**

The School has established a Learning Resource System consisting of periodicals, books, and video-cassette software to supplement and to assist in the teaching of its programs. These resources are available to students seeking other material to support their curriculum. The School also maintains a subscription to the Library and Information Resources Network (LIRN) as an additional learning resource.

### **JOB PLACEMENT ASSISTANCE**

SAM Tech will assist graduates and students to locate suitable employment. The School does not guarantee employment, but stands ready to help in the job search. With the student's consent, information on the student's demonstrated performance will be made available to prospective employers and to students upon request without charge.

### **STUDENT ACTIVITIES**

The School of Automotive Machinists & Technology does not maintain a regularly planned student activities calendar. The School does, from time to time, arrange for field trips, seminars, and other special activities that they feel are supportive to the course of study as well as being socially acceptable and entertaining to the student body. Examples of such activities include tours of local professional race team shops, seminars featuring performance and race engine builders, technical speakers from parts and equipment manufacturers, and tours of working machine shops.

### **STUDENT CONSUMER INFORMATION MANUAL**

Please refer to the Student Consumer Information manual for details about the School's policies and procedures.

### **FINANCIAL ASSISTANCE**

Financial aid programs consisting of grants, loans or private financing are available to those who qualify. Contact the financial aid office for qualifications and details.

### **SUPPLEMENTAL INCOME**

The School of Automotive Machinists & Technology will assist in locating positions and placing students in full or part time jobs, while attending School, if desired.

### **SCHOOL CALENDAR AND HOURS**

School holidays will be New Year's Holiday, Spring Break, Good Friday, Memorial Day, Independence Day/Summer Break, Labor Day, Thanksgiving, and Winter Holiday. See Supplement A for day school classes and night school classes for program entrance and ending dates.

### **CLASS HOURS**

#### **DAY SCHOOL**

Class is scheduled for 4.5 hours per day, Monday-Friday, for 22.5 clock hours per week, from 8:00 a.m. to 12:30 p.m.; afternoon class from 1:30 p.m. to 6:00 p.m.; a 15-minute break will be given at 9:55 a.m. and 3:25 p.m. Courses 103, 104, 105, and 106 are delivered Monday-Thursday from 7:00 a.m. to 12:30 p.m. (5.5 hours per day, 22 clock hours per week.) Special class sessions may be scheduled.

#### **NIGHT SCHOOL**

Class is scheduled for 4 hours per evening, Monday-Thursday for 16 clock hours per week, from 6:00 p.m. to 10:00 p.m.; a 15-minute break will be given at 7:55 p.m. (when in session). Special class sessions may be scheduled.

**GENERAL EDUCATION SECTION** Please see the course syllabus for the schedule of the general education section classes.

### **OFFICE HOURS**

The School business office shall be open Monday through Thursday from 9:00 a.m. to 6:00 p.m. (6:30 p.m. if Night Class scheduled) and on Friday from 9:00 a.m. to 5:00 p.m.

### **TEXTBOOKS AND MANUALS**

Textbooks and manuals are available for purchase from the School. Students must have all required textbooks and manuals on the first day of class.

### **TOOLS AND SUPPLIES**

All tools necessary for training are supplied. It is recommended that the student purchase a dial caliper tool at approximately \$75.00. This caliper is used throughout the program and will be used when the student graduates and obtains employment in the occupational field.

### **SCHOOL PAYMENT PLANS**

The School accepts tuition wholly before entry, or offers weekly or monthly payment plans to meet the student's needs. Method of payment will be arranged prior to or on the day of entry.

### **COLLECTION OF DELINQUENT FEES AND PAYMENTS**

The student who terminates with tuition or other fees due the School are requested to make arrangements for payment at the time of termination. The School will attempt to secure payment within one month. Should the amount due remain unpaid for a period of 30 days after the student leaves the School, the account will be submitted to a collection agency.

**WITHDRAWAL FROM SCHOOL** Any student wishing to withdraw from the School should contact the Education Director. Failure to withdraw properly may result in the assignment of failing grades that appear on the student's permanent record. When withdrawing, the student should complete a withdrawal form. All loaned books and materials must be returned in satisfactory condition or the student will be charged for their replacement.

### **MINIMUM CANCELLATION POLICY**

A full refund will be made to any student:

1. Who cancels the enrollment contract within 72 hours (until midnight of the third day excluding Saturdays, Sundays and legal holidays) after the enrollment contract is signed. A full refund will also be made to any student who cancels enrollment within the student's first three scheduled class days, except that the school may retain not more than \$100 in any administrative fees charged, as well as items of extra expense that are necessary for the portion of the program attended and stated separately on the enrollment agreement.

2. Whose enrollment was procured as a result of any misrepresentation in advertising, promotional materials of the School, or misrepresentations by the owner or representatives of the School.
3. An applicant rejected by the School is entitled to a refund of all monies paid.
4. An applicant has the right to cancel this contract if he/she was recruited by a door-to-door salesman.
5. Students who have not visited the School facility prior to enrollment will have the opportunity to withdraw without a penalty within three days following either attendance at a regularly scheduled orientation or following a tour of the School facilities and inspection of equipment.

### **REFUND POLICY**

1. Refund computations will be based on scheduled clock hours of class attendance through the last date of attendance. Leaves of absence, suspensions, and School holidays will not be counted as part of the scheduled class attendance.
2. Refunds for resident programs and synchronous distance education courses or programs will be based on the period of enrollment computed on the basis of course or program time;
3. The effective date of termination for refund purposes in residence programs and synchronous distance education courses or programs will be the earliest of the following:
  - (a) The last date of attendance, if the student is terminated by the school or college;
  - (b) The date of receipt of written notice of withdrawal from the student; or
  - (c) 10 school days following the last date of attendance;
4. If tuition and fees are collected in advance of entrance, and if, after expiration of the 72-hour cancellation privilege, the student does not enter the residence career school or college, not more than \$100 shall be retained by the school or college;
5. For the student who enters a residence program or a synchronous distance education program and who withdraws or is otherwise terminated, the school or college may retain not more than \$100 of any administrative fees charged and the minimum refund of the remaining tuition and fees will be the pro rata portion of tuition, fees, and other charges that the number of hours remaining in the portion of the course or program for which the student has been charged after the effective date of termination bears to the total number of hours in the portion of the course or program for which the student has been charged, except that a student may not collect a refund if the student has completed 75 percent or more of the total number of hours in the portion of the program for which the student has been charged on the effective date of termination;
6. Refunds of items of extra expense to the student, such as books, tools, or other supplies should be handled separately from refund of tuition and other academic fees. The student will not be required to purchase instructional supplies, books, and tools until such time as these materials are required. Once these materials are

### 3 GENERAL INFORMATION



Original Ford 427 on the Dyno

purchased, no refund will be made. For full refunds, the school can withhold costs for these types of items from the refund as long as they were necessary for the portion of the program attended and separately stated in the enrollment agreement. Any such items not required for the portion of the program attended must be included in the refund;

7. Refunds based on enrollment in residence and synchronous distance education courses or programs be totally consummated within 60 days after the effective date of termination;
8. Refunds for asynchronous distance education courses or programs will be computed on the basis of the number of lessons in the course or program;
9. The effective date of termination for refund purposes in asynchronous distance education courses or programs will be the earliest of the following:
  - (a) The date of notification to the student if the student is terminated;
  - (b) The date of receipt of written notice of withdrawal from the student; or
  - (c) The end of the third calendar month following the month in which the student's last lesson assignment was received unless notification has been received from the student that the student wishes to remain enrolled;
10. If tuition and fees are collected before any courses for a program have been completed, and if, after expiration of the 72-hour cancellation privilege, the student fails to begin the program, not more than \$50 shall be retained by the school or college;
11. In cases of termination or withdrawal after the student has begun the asynchronous distance education course or program, the school or college may retain \$50 of tuition and fees, and the minimum refund policy must provide that the student will be refunded the pro rata portion of the remaining tuition, fees, and other charges that the number of courses completed and serviced by the school or college bears to the total number of courses in the program; and
12. Refunds based on enrollment in asynchronous distance education schools or colleges will be totally consummated within 60 days after the effective date of termination.
  - (a) A career school or college shall record a grade of "incomplete" for a student who withdraws during the portion of a

course or program for which the student is not eligible to collect a refund under Subsection (b)(4) if the student requests the grade at the time the student withdraws and the student withdraws for an appropriate reason unrelated to the student's academic status. A student who receives a grade of "incomplete" may re-enroll in the course or program during the 12-month period following the date the student withdraws and complete those incomplete subjects without payment of additional tuition for that portion of the course or program.

- (b) A program that is 40 hours or less of program time, or a seminar or workshop, is exempt from the 72-hour rule provided by Subsection (a). The career school or college shall maintain a policy for the refund of the unused portion of tuition, fees, and other charges in the event the student fails to enter the program or withdraws or is discontinued from the program at any time before completion of the program as provided by this section. The policy must provide that:
  - (1) Refunds are based on the period of enrollment computed on the basis of course or program time;
  - (2) The effective date of termination for refund purposes is the earlier of:
    - (i) The last date of attendance; or
    - (ii) The date the school or college receives written notice from the student that the student is withdrawing from the class; and
  - (3) The student will be refunded the pro rata portion of tuition, fees, and other charges that the number of hours remaining in the portion of the program for which the student has been charged after the effective date of termination bears to the total number of hours in the portion of the program for which the student has been charged.
13. If this Contract is sold, assigned, or transferred by the School of Automotive Machinists & Technology with or without recourse, the above refund policy will continue to apply.
14. **REFUND POLICY FOR STUDENTS CALLED TO ACTIVE MILITARY SERVICE**

A student of the School or college who withdraws from the School or college as a result of the student being called to active duty in a military service of the United States or the Texas National Guard may elect one of the following options for each program in which the student is enrolled:

  - (a) if tuition and fees are collected in advance of the withdrawal, a pro rata refund of any tuition, fees, or other charges paid by the student for the program and a cancellation of any unpaid tuition, fees, or other charges owed by the student for the portion of the program the student does not complete following withdrawal;
  - (b) a grade of incomplete with the designation "withdrawn-military" for the courses in the program, other than courses for which the student has previously received a grade on the

student's transcript, and the right to re-enroll in the program, or a substantially equivalent program if that program is no longer available, not later than the first anniversary of the date the student is discharged from active military duty without payment of additional tuition, fees, or other charges for the program other than any previously unpaid balance of the original tuition, fees, and charges for books for the program; or

- (c) the assignment of an appropriate final grade or credit for the courses in the program, but only if the instructor or instructors of the program determine that the student has:
  - (1) satisfactorily completed at least 90 percent of the required coursework for the program; and
  - (2) demonstrated sufficient mastery of the program material to receive credit for completing the program.

#### 15. See Supplement B for Return of Title IV Funds Policy.



CNC machine initial set up

#### ADMISSION POLICIES/ DISABILITY SERVICES

The School of Automotive Machinists & Technology is an equal opportunity School and is dedicated to a policy of non-discrimination in employment and training. Prospective students will not be denied admission on the basis of race, color, national origin, sex, religion, handicap, age or veteran status (except where age, sex, or handicap constitute a bona fide occupational qualification necessary for proper and efficient administration).

#### ADMISSION/APPLICATION PROCEDURES

Persons seeking admission should apply in person, e-mail to [admissions@samtech.edu](mailto:admissions@samtech.edu), or by writing to the Admissions Department, The School of Automotive Machinists & Technology, 1911 Antoine, Houston, TX 77055-1803. Prior to acceptance for enrollment, each prospective student must:

- Submit a completed application form.
- Submit a registration fee of \$100. (This may be paid after enrollment)
- Tour School facilities.
- Submit a High School Diploma, an Official Transcript, or GED.
- Be at least 17 years of age.
- Be computer literate (CNC Machining and EFI Calibration programs only).
- Satisfactorily complete all tests required.

The tests are the property of the School and will not be returned to the applicant. The School will notify the applicant of action taken on his/her admission request. If the student does not begin class, the registration fee will be refunded upon request.

**ADMISSION/ENROLLMENT**

The student must be a high school graduate or pass the General Education Development Test (GED), High School Equivalency Test (HiSET), Test Assessing Secondary Completion (TASC) and must be at least 17 years of age, (under 18 requires parental consent). In addition, the School requires the Bennett Mechanical Comprehension Test with a passing score of 39, which is the mean score for a 12th grade student, as an entrance exam. A student that fails the test shall wait a minimum of 24 hours before the retake. In addition to these requirements, degree applicants must submit an essay explaining their career goals and obtain a Harris County Public Library card. See each program for any additional admission requirements.

**CHECKING THE VALIDITY OF A HIGH SCHOOL DIPLOMA**

A school administrator will evaluate all high school diplomas or transcripts submitted by prospective students applying for admission. If the administration has reason to doubt the validity of a high school diploma or transcript, the following procedures will be taken to verify the student's high school completion: 1) Contact the high school to confirm the validity of the student's diploma; and 2) Confirm with the relevant department or agency in the state in which the secondary school is located that the secondary school is recognized as a provider of secondary school education. If a diploma is determined invalid, a high school equivalency exam may be required for admission consideration.

**WAITLIST POLICY**

Should enrollment capacity reach its maximum for a given program, the student may be waitlisted for up to 2 weeks from the program start date. Students on the waitlist must attend classes at the beginning of the program. If space becomes available, the waitlisted student will convert to an enrolled student. The School does not guarantee that waitlisted students will become enrolled. Waitlisted students that do not become enrolled will receive a 100% refund of any monies paid to the School.

**PREVIOUS EDUCATION/TRAINING CREDIT (INCLUDING MILITARY)**

Previous work experience and/or education must satisfactorily attest to the potential for course credit. A student provides information about previous education or experience through transcripts and employment records. Before experience earned credit can be awarded, the student must pass a hands-on proficiency assessment and a written test to determine if the student has the knowledge level for credit. Credit received through transfer or placement testing will decrease program tuition according to the number or course transfer or test approvals. Credit hours which are granted from transfer or placement testing do not count toward earned credit hours in computing the cumulative grade point average. There are no charges or fees for transferring credits or requesting placement testing credit for any course in a technical component. The minimum grade to transfer academic credit is a "C."

**GENERAL EDUCATION SECTION  
TRANSFER OF CREDIT**

Students enrolled in the Associate of Applied Science in Automotive Engine/Block & Cylinder Head Machining degree program may transfer a maximum of 7 general education credits from another institution. To receive credit, the student must supply the School with the course outline and/or catalog description, learning objectives, and transcript of credits earned. A minimum grade of "C" must be achieved to transfer general education credits from another institution. If transferring more than 3 general education credits, the cumulative average of the units must be at least 3.0.

**TRANSFER OF CREDITS TO ANOTHER INSTITUTION**

The School of Automotive Machinists & Technology will make its official transcript and copy of its applicable school catalog available to other institutions at a student's request. However, all students are reminded that acceptance of School of Automotive Machinists & Technology credits is at the complete discretion of the receiving institution. You should check with the receiving institution to determine if credits earned at the School of Automotive Machinists & Technology will transfer.

**RE-ADMISSION/APEAL**

When a student has extraordinary circumstances, an appeal may be submitted in writing to the Director. These circumstances will be considered in making a determination on satisfactory progress. The student's written appeal must document the circumstances and reason(s) the appeal should be considered. The Director will consider each case on its own individual merit and a decision shall be placed in the student's file. These standards of satisfactory progress are designed to give all students a reasonable opportunity to progress and obtain their educational objectives. In order for a student to be considered to be making satisfactory progress, he/she must meet the attendance policy below.

**TARDINESS**

A student not present at the time of checking roll will be counted absent in 30 minute increments. All missed work must be made up.

**ATTENDANCE**

Roll is checked each class period, and attendance is recorded by the instructor. Attendance is entered daily onto the master attendance record of each student.

Tardiness or leaving class early will result in absences measured in 30 minute increments. School holidays or leaves are not considered as days of absence. Under NO circumstances is an absence considered excused. Termination from training, for reasons of unsatisfactory attendance will occur if:

1. A student is absent in excess of more than 10 consecutive School days.
2. A student cannot miss more than 20% of the total course hours.
3. A student is absent in excess of any number of days if the student fails to return as scheduled from an approved leave of absence.
4. Military, being absent 20% of the total program and/or being absent five [5] consecutive days will be reported to the VA within 30 days.

A student's overall record of attendance will be evaluated in determining his/her progress during training. If the attendance of the student is interfering with academic progress, a

conference with the Director may be required to evaluate the continuance of the student in the program. A student that has been terminated for excessive absences will not be allowed to enter for a third time. The student whose enrollment is terminated for violation of the attendance policy may not re-enter before the start of the next grading period (see student evaluation). This does not circumvent the approved refund policy (see Appeal/Re-admission).

The following symbols are used:

P = PRESENT    G = GRADUATED  
 A = ABSENT    B = SCHEDULED BREAK  
 T = TARDY    X = TERMINATED  
 C = CANCEL    S = SPECIAL (make-up)  
 H = HOLIDAY    BE = BREAK in ENROLLMENT  
 L = LEAVE OF ABSENCE  
 S = SUSPENSION

of Causes of Termination, Attendance, or for other performance or behavior problems. Such suspensions will be for a specified period after which a student may apply for re-enrollment (see Appeal/Re-admission).

**LEAVE OF ABSENCE**

A student may request a leave of absence from the School for unforeseen circumstances such as; military obligations, personal, medical or financial, etc. The period of the leave of absence may not begin until the student has submitted and the School has approved a written and signed request for an approved leave of absence except in those cases where unforeseen circumstances would prevent a student from submitting a request in advance. The School may grant two leaves of absence provided that the combined leaves of absence do not exceed 180 days within the 12-month period and that each leave of absence is properly requested by the student in accordance with the School's policy and standards set forth here. If the student does not return following the leave of absence, the School must terminate the student and apply the School's refund policy in accordance with applicable and published requirements.

**CONDUCT POLICY**

Enrollment at the School of Automotive Machinists & Technology should be personally satisfying as well as enjoyable and technically rewarding. It is equally important that each student respect the individual rights of associates within the School. Any student who is dismissed for reasons of serious misconduct has a right to ask for an administrative hearing but is advised that re-entry is difficult.

**CAUSES OF TERMINATION**

A list of serious offenses within the School includes:

1. Dishonesty or cheating.
2. Using drugs or alcohol within the building, possessing them, or distributing them as prohibited by law.
3. Stealing the belongings of other persons or the property of the School.
4. Physically abusing any person on School property or at School-sponsored activities.
5. Physically abusing School property.
6. Obstructing or disrupting teaching.
7. Abusive, vulgar, or profane language.
8. Displaying or using articles of violence on School property.

The School reserves the right to suspend and/or dismiss a student for the reasons listed above, but does not limit itself to those listed.

# 5 SCHOOL POLICIES

## STUDENT COMPLAINT PROCEDURE

Schools accredited by the Accrediting Commission of Career Schools and Colleges must have a procedure and operational plan for handling student complaints. If a student does not feel that the school has adequately addressed a complaint or concern, the student may consider contacting the Accrediting Commission. All complaints reviewed by the Commission must be in written form and should grant permission for the Commission to forward a copy of the complaint to the school for a response. This can be accomplished by filing the ACCSC Complaint Form. The complainant(s) will be kept informed as to the status of the complaint as well as the final resolution by the Commission. Please direct all inquiries to:

Accrediting Commission of  
Career Schools & Colleges  
2101 Wilson Boulevard, Suite 302  
Arlington, VA 22201  
(703) 247-4212

[www.accsc.org](http://www.accsc.org) | [complaints@accsc.org](mailto:complaints@accsc.org)

A copy of the ACCSC Complaint Form is available at the school and may be obtained by contacting [complaints@accsc.org](mailto:complaints@accsc.org) or at

<https://www.accsc.org/StudentCorner/Complaints.aspx>.

and/or

Texas Workforce Commission  
Career Schools and Colleges, Room 226T 101 E.  
15th Street  
Austin, Texas 78778-0001  
512-936-3100  
[texasworkforce.org/careerschools](http://texasworkforce.org/careerschools)

A copy of the ACCSC Complaint Form is available at the school and may be obtained by contacting Linda Massingill, Executive Director, or online at [www.accsc.org](http://www.accsc.org).

Degree students with an unresolved complaint may contact:

Texas Higher Education Coordinating Board  
College Readiness and Success Division  
P.O. Box 12788  
Austin, TX 78711-2788  
512-427-6101  
[www.theceb.state.tx.us/studentcomplaints](http://www.theceb.state.tx.us/studentcomplaints)

The web address for the rules governing student complaints-Title 19 of the Texas Administrative Code, Sections 1.110-1.112:

[http://texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac\\_view=5&ti=19&pt=1&ch=1&sch=E&rl=Y](http://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=19&pt=1&ch=1&sch=E&rl=Y)

## ACADEMIC STRUCTURE AND GRADING

The program objectives are to prepare students for entry-level employment in their chosen career. For this reason, grading is administered to determine the student's progress in terms related to employee proficiency expected by business and industry. Grading is based on nine key performance factors including knowledge of theory, lab proficiency, appearance, courtesy, dependability, cooperation, initiative, attendance and safety.



Machinists Math and Measurement course

### PERFORMANCE FACTOR GRADING SYSTEM

E = Excellent      F = Fair  
G = Good          P = Poor

### SUBJECT GRADING SYSTEM LAB/THEORY

Numeric Grade	Grade Points
90-100 (Excellent)	4.0 (A)
80-89 (Good)	3.0 (B)
70-79 (Fair)	2.0 (C)
60-69 (Poor)	1.0 (D)
0-59 (Failure)	0.0 (F)
I (Incomplete)	Not computed in grade point average
W (Withdrawal)	Not computed in grade point average
CR (Course Repetition)	Is computed in grade point average

### SIZE OF CLASS

Class size is limited to provide adequate personal instruction in both classroom and lab, and to allow access to special tools and equipment. With this objective in mind, the maximum student to instructor ratio is thirty to one (30-1) for theory and twenty to one (20-1) for lab.

### GRADUATION

A candidate for graduation must have completed the program, show a cumulative grade point average (GPA) of at least 2.0 (Grade of "C") on all work attempted, and must have cleared his/her account with the School. Upon successful completion of the requirements for graduation, SAM Tech will award a Certificate of Completion. Degree students will receive an Associate of Applied Science degree.

### AWARDS

Awards are presented at graduation to those students maintaining a perfect attendance record and to those students maintaining an overall 99% excellence in attendance record.

### MAKE-UP WORK

A student who has missed assignments due to absences will be allowed to make up these assignments. Make-up work shall not be authorized for the purpose of removing an absence.

1. No more than 5% of the total course time hours for a program may be made up.
2. The school shall submit make-up work policies to the Commission for approval.
3. Make-up work shall:
  - (a) be supervised by an instructor approved for the class being made up;
  - (b) require the student to demonstrate substantially the same level of knowledge or competence expected of a student who attended the scheduled class session;
  - (c) be completed within two weeks of the end of the grading period during which the absence occurred;
  - (d) be documented by the school as being completed.

The school may close due to inclement weather or emergencies (e.g. flooding, icy roads, power failures, etc.) SAM Tech follows HISD guidelines for such conditions. These announcements are made on radio and television stations and posted online. School Director will determine make-up dates in such instances.

### SATISFACTORY ACADEMIC PROGRESS

SAM Tech's Satisfactory Academic Progress (SAP) policy is based on federal regulation and applies to all enrolled students. The policy includes metric components, applicable definitions, and details regarding appeal.

1. A student is in good standing if a cumulative Grade Point Average (GPA) of 2.0 (70%) or better is maintained, attendance is in accordance with School policy, and at least 66.67% of the attempted credit hours are completed (Pace Of Progression [POP]). Progress is documented by Progress Reports. See Student Evaluation for the details regarding Progress Reports.
2. A student who does not meet one or more of the three (3) metrics listed above will be placed on academic/financial aid warning for the next payment period. Students on academic/financial aid warning will continue to receive Title IV funds for the duration of the period. To maintain eligibility after one payment period and return to good standing, a student must satisfy the minimum standards all three SAP components by the end of the academic/financial aid warning period.
3. If a student fails to achieve the SAP requirements by the end of the warning period, they are placed on academic/financial aid probation and will lose eligibility for Title IV funds, but can appeal and re-establish program eligibility and continue matriculation.
4. A student that successfully appeals will re-establish Title IV eligibility and will be placed on academic/financial aid probation for the subsequent payment period. A student who is placed on academic/financial aid probation, for any reason, shall have 4 weeks (day students) or 8 weeks (night students) in which to rectify deficiencies and return to good standing.
5. When a student is placed on academic/financial aid probation, that student will be advised prior to returning to class, of the beginning date and the action taken. The terms of the probation shall be clearly



Race engine dyno testing

indicated on the appropriate permanent records.

6. A student placed on academic/financial aid probation may attend supplementary tutoring during probation, if necessary (see Individualized Assistance).
7. A student who fails to achieve overall SAP at the end of the probation period will be terminated. A student may appeal the School's termination in writing. See Re-Admission/Appeal on page 4.
8. A student whose enrollment was terminated for unsatisfactory progress may re-enroll after a minimum of one grading period. This does not circumvent the approved refund policy.
9. A student who returns after the enrollment was terminated for not maintaining SAP shall be placed on probation for the next grading period. The student shall be advised of this action and the student's file will be accordingly documented. If the student does not maintain SAP at the end of this probationary period, the student shall be terminated.
10. A student must complete the program within 1.5 times the length of the program to meet minimum requirements specified by the Maximum Time Frame (MTF).

**ACADEMIC/FINANCIAL AID PROBABATION APPEALS**

To appeal academic/financial aid probation, a student must prepare a written statement explaining

- the factors that prevented the student from meeting SAP accompanied by supportive documentation.
- what has changed that will allow the student to maintain SAP.
- how the student will maintain SAP.

Appeals to establish academic/financial aid probation must be submitted within one week of the student being notified of failure to meet the terms of the academic/financial aid warning.

**SEMINARS**

**(These courses do not fall within the scope of ACCSC accreditation)**

**Taking the Mystery Out of CAM Degreering and Valve Timing Seminar (non-credit) 8hrs**

Attendees will be introduced to CAM Pro Plus, a software and sensor package for measuring and analyzing motion profiles. Along with looking at lobe profiles, duration, lobe separation, centerlines and lift can be identified. The effects of varied CAM timing events and their relationship to engine performance will be thoroughly explored.

No entrance requirements.

**101 High Performance Marketing Seminar (non-credit) 2 sections 16hrs**

Attendees will be introduced to basic marketing concepts as it applies to the high performance industry. Content will include an exploration of the size of the high performance after market industry; an exploration of brand and brand management; marketing success measurements; social media; website development. This concludes Part 1 (8hrs). Part 2 will cover product placement; event marketing; local marketing; how to develop advertising; developing a communications plan; and other topics relevant to the modern marketing expert (8hrs). Application of marketing principles as they apply to the individual as well as the small engine shop will be included.

No entrance requirements.



Students working in shop lab

**201 Social Media Marketing Seminar (non-credit) 2 sections 16 hrs**

This seminar is designed to explore the world of marketing in the high performance industry using social media. Attendees will learn proven techniques that will allow product exposure. The seminar also includes performance-oriented discussion forums. Part 1 (8hrs) will cover Facebook and YouTube. Part 2 (8 hrs) will cover Instagram, Snapchat, and Twitter. Prerequisite: 101 High Performance Marketing.

**COURSE INCOMPLETION**

A student who is obligated for full tuition may request a grade of "incomplete." This occurs if the student has failed to meet a course requirement due to illness or other reason beyond his/her control as excused by the course instructor. The student must be in good standing at the time that an incomplete grade is awarded. An incomplete grade of "I" is awarded to the student at the end of the academic term.

The student is allowed a maximum of three weeks into the next term to rectify a grade of incomplete. If the incomplete is not rectified within that period, the incomplete is automatically converted to an "F."

If the student earns an "F" he/she is placed on academic probation.

A grade of "I" indicates that required coursework was not completed during the course length. This grade does not count as credit hours attempted and is not included in the GPA calculation.

Once the final grade has been awarded, the course is counted as credit hours attempted and calculated into the GPA and is applied to SAP.

**WITHDRAWALS**

If a student wishes to withdraw from a class before completion of a subject and/or before finals are given, he or she must complete a Change of Status form with the Registrar or Financial Aid. A withdrawal grade of "W" will be awarded at the time of withdrawal to a student with a passing grade. A student with failing grades at the time of withdrawal will be given an "F." It must be understood that a withdrawal may alter the student's date of graduation and eligibility for financial aid. The student must see his/her financial aid officer to discuss the impact of withdrawals on their financial aid. Tuition charges will be calculated through the last date of attendance. The date of withdrawal will be the effective date of termination.

**COURSE REPETITIONS**

SAM Tech students may repeat a course only one time. No more than three courses may be repeated throughout the academic program.

When a student re-takes a course, the former grade remains on the student's transcript and is used in assessing the student's academic progress (SAP). However, after the student retakes a course, only the latter grade is used in the calculation of the GPA.

The student must see his/her financial aid officer to discuss the impact of repeated courses on their financial aid.

**INDIVIDUALIZED ASSISTANCE**

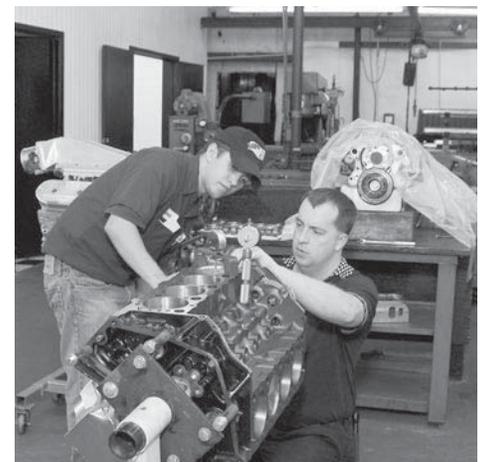
School instructors are available to assist students who feel additional attention is needed in maintaining their academic standing. SAM Tech encourages all students to use this time to their full advantage. The student needing arrangements should contact the Director of Education and/or Executive Director.

**STUDENT EVALUATION**

The student's progress reports are issued at the following grading periods: 4 weeks, 12 weeks, 18 weeks, 22 weeks, 30 weeks and/or 25%, of 50%, 75% program completion.

Students enrolled in general education courses receive a progress report at each course completion and at 50% of program completion.

These reports evaluate attendance, academic performance, appearance, courtesy, dependability, cooperation, initiative and safety.



Cam degreering

# 7 AUTOMOTIVE ENGINE/BLOCK MACHINING

## PROGRAM OBJECTIVES:

The program objective of Automotive Engine/Block Machining is to qualify the student as an automotive machinist. This program is to provide an opportunity for a student to achieve an entry level skilled trade in the automotive field. Although the actual machining process will be the emphasis of the program, a thorough education on theory of operation of the modern automotive engine will be presented. Performance modifications effect on power, longevity, and emissions, will be highlighted throughout the different courses. This program is intended for the mechanically inclined student with a desire to work in the automotive industry. The program will include both classroom and hands-on lab instruction. The School of Automotive Machinists & Technology measures student progress in semester credit hours. One semester credit hour for each fifteen (15) hours of classroom contact plus appropriate outside preparation or the equivalent; or one semester credit hour for each thirty (30) hours of laboratory work plus appropriate outside preparation. This program has an outside work requirement for completion. Please see the course descriptions for additional information. Single subjects making up this program are not offered individually. The students will learn performance machining operation skills on industry standard machines, a boring bar, Sunnen cylinder hones, align hone and rod resizer, as well as a SuperFlow dynamometer and DynoJet chassis dynamometer. See Equipment List Addendum for a complete list of machines used in the Block Machining Program.



Engine block honing

## TEXAS WORKFORCE COMMISSION

COURSE	TITLE	THEORY	LAB	TEXAS WORKFORCE COMMISSION			TOTAL CLOCK HOURS
				SEM HRS	ACCSC THEORY	LAB	
101	Work Practices, Tools, & Safety	1.0	0.5	1.5	15.0	15.0	30.0
102	Machinists Math & Measurement Inspection	3.0	0.5	3.5	45.0	15.0	60.0
103*	Principles & Theories/Internal Engine (Oiling & Gaskets)	2.0	0.0	2.0	30.0	0.0	30.0
104*	Dyno Operations	1.0	0.0	1.0	15.0	0.0	15.0
105*	Engine Block Blueprinting	1.0	0.0	1.0	15.0	0.0	15.0
106*	Balancing of Crankshafts, Rods & Pistons	2.0	0.5	2.5	30.0	15.0	45.0
107*	Block Camshafts & Valve Train Technologies	5.5	0.5	6.0	82.5	15.0	97.5
108*	Engine Bearing Fundamentals	2.0	0.0	2.0	30.0	0.0	30.0
109*	Analysis of Pistons & Rings	3.0	0.0	3.0	45.0	0.0	45.0
110*	Fuel Systems, Ignitions, Power Speed Calculator & Weather Station	2.0	0.0	2.0	30.0	0.0	30.0
111*	Design & Function of Engine Block Components	2.0	0.0	2.0	30.0	4.25	34.25
112*	Filing Rings, Gap Requirements & Oil Tension	1.0	0.0	1.0	15.0	4.0	19.0
113*	The Effects of Honing with Profilometer	1.0	0.0	1.0	15.0	4.25	19.25
114*	Engine Block Teardown & Math Refresher	0.0	0.5	0.5	0.0	15.0	15.0
115*	Operation of Engine Block Machining Equipment	1.0	3.0	4.0	15.0	90.0	105.0
116*	Engine Block Assembly (Blue Printing & Cam Degreeing)	2.0	1.0	3.0	30.0	60.0	90.0
117*	Dyno Testing	1.0	0.5	1.5	15.0	15.0	30.0
118*	Career Planning	1.0	0.0	1.0	15.0	0.0	15.0
<b>Totals</b>		<b>31.5</b>	<b>7.0</b>	<b>38.5</b>	<b>472.5</b>	<b>252.5</b>	<b>725.0**</b>

\* Requires 101 and 102 as prerequisites \*\* Outside work is not included

The approximate time to complete this program is thirty-six (36) weeks (day) and forty-five (45) weeks night. The total program weeks do not include school breaks.

## COURSE DESCRIPTIONS/SYNOPSIS

### 101 ENGINE BLOCK ENGINE WORK PRACTICES, TOOLS, AND SAFETY (15/15/1.5)

The student will gain a general introduction to the industry work environment including customer relations, work orders, build sheets, and block parts acquisition. The student will be introduced to the use of precision measurement and the required specialized, as well as basic hand tools. Special emphasis is placed on personal and shop safety due to the nature of potentially hazardous equipment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### 102 ENGINE BLOCK MACHINIST MATH AND MEASUREMENT (45/15/3.5)

The student will learn procedures of careful inspection and precise measurement technologies, combined with the proper applications, formulas, and machinist math, to provide a solid basis for successful production and high performance engine assembly procedures. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### 103 PRINCIPLES AND THEORIES OF ENGINE BLOCK (30/0/2.0)

The student will explore the basic theory and concepts of internal combustion engine operation, and then move into more specific and complex areas including torque, airflow, volumetric efficiency, operating cycles, and horsepower. Outside-the-classroom work is required. This course includes an average of 8.75 hours of outside the classroom work.

### 104 DYNO OPERATIONS (15/0/1.0)

The student will learn the operation of an engine dynamometer to confirm performance modifications and durability. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### 105 ENGINE BLOCK BLUEPRINTING (15/0/1.0)

The student will learn the art of producing maximum capable horsepower including; torque, volumetric efficiency, and RPM through precise component assembly. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### 106 BALANCING OF CRANKSHAFTS (30/15/2.5)

The student will learn and practice the key elements of balancing a rotating assembly to insure the crankshaft counterweights offset the rotating and recipitating forces created by pistons and rods. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

### 107 ENGINE BLOCK CAMSHAFTS AND VALVE TRAIN TECHNOLOGIES (82.5/15/6.0)

The student learns the effects of camshaft selection, degreeing, and valve timing in relation to cylinder pressure, will be studied. Outside-the-classroom work is required. This course includes an average of 24.37 hours of outside the classroom work.

**108 ENGINE BEARING FUNDAMENTALS (30/0/2.0)**

Students will learn material selection, clearance, and proper assembly of the internal combustion engine bearings and modifications for high load/high RPM's racing engines. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

**NOTES:****109 PISTONS AND RINGS (45/0/3.0)**

The students learn the understanding of the relationship between pistons and rings as used in the high-performance engine application. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

**110 FUEL SYSTEMS, IGNITIONS, POWERSPEED CALCULATOR AND WEATHER STATION (30/0/2.0)**

The student will learn the importance of fueling and igniting the engine cylinders for max reliable power utilizing power speed calculators and weather station data to produce consistent reliable power. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

**111 DESIGN AND FUNCTION OF ENGINE BLOCK COMPONENTS (30/4.25/2.0)**

The student will learn the individual components, their function, design, material composition, and differences. This includes the relationship of the individual pieces to each other and the assembly as a whole. Production and performance variations will also be discussed. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

**112 FILING RINGS, GAP REQUIRMENTS AND OIL TENSION (15/4.0/1.0)**

Ring filing to set gaps for specific engine power ranges and race applications. Ring fitting in actual finished cylinders is included. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

**113 THE EFFECTS OF HONING UTILIZING A PROFILOMETER (15/4.25/1.0)**

Students will learn to calculate four different cylinder wall measurements Average Roughness (Ra), Core Roughness (Rk), Reduced Pick Height (Rpk), and Reduced Valley Depth (Rvk). Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

**114 ENGINE BLOCK TEARDOWN AND MATH REFRESHER (.5/15/0.5)**

The student learns the techniques of thorough examination and evaluation during disassembly to correctly diagnose potential problems, engine failure, and component replacement. Cleaning methods for both cast iron and aluminum are covered, including the impact of current environmental concerns. Additionally, crack detection methods and casting repairs are also covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

**115 OPERATION OF ENGINE BLOCK MACHINING EQUIPMENT (15/90/4.0)**

The student learns the set-up and operation procedures for the machining equipment. They will also learn the procedures used to complete the machining of block and component parts. The differences between standard and high-performance applications will be highlighted. Outside-the-classroom work is required. This course includes an average of 26.25 hours of outside the classroom work.

**116 ENGINE BLOCK ASSEMBLY (BLUE PRINTING AND CAM DEGREEING) (30/60/3.0)**

The primary focus of this course is mastering the art of assembling precisely machined components into a complete operating engine, not only basic rebuild practices but blue printing specifications for different horsepower levels. The student will learn cam degreeing with consideration of application and referencing piston to valve clearance. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside the classroom work.

**117 DYNO TESTING (15/15/1.5)**

The student will experience setting up and running an engine dynamometer. This will include engine break-in, optimization of torque & horsepower while monitoring ignition timing and air fuel ratio. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

**118 ENGINE BLOCK CAREER PLANNING (15/0/1.0)**

The student is prepared to enter the work force by learning the importance of personal appearance, conduct, attitude and mechanical aptitude. Job search techniques, the application process, effective resume composition, and interviewing skills are covered. Career goal setting, steps toward self-employment, and job placement assistance is covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

# 9 AUTOMOTIVE ENGINE/CYLINDER HEAD MACHINING

## PROGRAM OBJECTIVES:

The objective of Automotive Engine/Cylinder Head Machining is to qualify the student as an automotive cylinder head machinist. This program is to provide an opportunity for a student to achieve an entry level skilled trade in the automotive field. The theory of operation and the cylinder head role in the engine operation will be thoroughly covered. Airflow characteristics and their effect on performance and longevity will be highlighted in all courses of this program. This program is intended for the mechanically inclined student with a desire to work in the automotive industry. The program will include both classroom and hands-on lab instruction. The School of Automotive Machinists & Technology measures student progress in semester credit hours. One semester credit hour for each fifteen (15) hours of classroom contact plus appropriate outside preparation or the equivalent; or one semester credit hour for each thirty (30) hours of laboratory work plus appropriate outside preparation. This program has an outside work requirement for completion. Please see the course descriptions for additional information. Single subjects making up this program are not offered individually. The students will learn performance machining operation skills on industry standard machines, Sunnen surfacer, seat and guide machine, valve guide workstation, and SuperFlow flow bench. See Equipment List Addendum for a complete list of machines used in the Cylinder Head Machining Program.



Cylinder head seat and guide machine

## TEXAS WORKFORCE COMMISSION

COURSE	TITLE	THEORY	LAB	SEM HRS	ACCSC		TOTAL CLOCK HRS
					THEORY	LAB	
201	Cylinder Head Work Practices, Tools, and Safety	2.0	0.0	2.0	30	0.0	30
202	Cylinder Head Machinist Math and Measurement	3.0	0.5	3.5	45	15.0	60
203*	Principles and Theories of Engine Cylinder Head	2.0	0.0	2.0	30	5.0	35
204*	Design and Function of Cylinder Head Components	2.0	0.0	2.0	30	0.0	30
205*	Cylinder Head Disassembly and Inspection	3.0	0.5	3.5	45	15.0	60
206*	Operation of Cylinder Head Machining Equipment	3.0	0.5	3.5	45	15.0	60
207*	Cylinder Head and Component Machining	6.0	3.5	9.5	90	105.0	195
208*	Cylinder Head Blueprinting	2.0	0.5	2.5	30	15.0	45
209*	Cylinder Head Assembly	2.0	2.0	4.0	30	60.0	90
210*	Cylinder Head Porting	2.0	2.5	4.5	30	75.0	105
212*	Cylinder Head Career Planning	1.0	0.0	1.0	15	0.0	15
<b>Totals</b>		<b>28.0</b>	<b>10.0</b>	<b>38.0</b>	<b>420</b>	<b>305.0</b>	<b>725 **</b>

\* Requires 201 and 202 as prerequisites

\*\* Outside work is not included

The approximate time to complete this program is thirty-six (36) weeks (day) and forty-five (45) weeks (night). The total program weeks do not include school breaks.

## COURSE DESCRIPTIONS/SYNOPSIS

### 201 CYLINDER HEAD WORK PRACTICES, TOOLS, AND SAFETY (30/0/2.0)

The student will gain a general introduction to the industry work environment including customer relations, work orders, build sheets, and cylinder head parts acquisition. The student will be introduced to the use of precision measurement and the required specialized, as well as basic hand tools. Special emphasis is placed on personal and shop safety due to the nature of potentially hazardous equipment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### 202 CYLINDER HEAD MACHINIST MATH AND MEASUREMENT (45/15/3.5)

The student will learn procedures of careful inspection and precise measurement technologies, combined with the proper applications, formulas, and machinist math to provide a solid basis for successful production and high performance cylinder head assembly procedures. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### 203 PRINCIPLES AND THEORIES OF ENGINE CYLINDER HEAD (30/5/2.0)

The student will learn the basic theory and concepts of internal combustion engine operation. The course then moves into more specific and complex areas including torque, airflow, volumetric efficiency, operating cycles, and horsepower. Outside-the-classroom work is required. This course includes an average of 8.75 hours of outside the classroom work.

### 204 DESIGN AND FUNCTION OF CYLINDER HEAD COMPONENTS (30/0/2.0)

The student will learn the how and why of the many components of cylinder head assembly and their relationship to each other. The function and various material compositions of cylinder head castings and components will also be covered. Standard and high performance differences will be discussed. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### 205 CYLINDER HEAD DISASSEMBLY AND INSPECTION (45/15/3.5)

The student will learn the proper procedure of head disassembly and careful inspection to determine any causes of failure, repair needs, and component replacement. Cleaning methods, crack detection, repair, and associated environmental issues, for both aluminum and iron heads, will also be discussed. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### 206 OPERATION OF CYLINDER HEAD MACHINING EQUIPMENT (45/15/3.5)

The student learns the set-up and operation procedures of machining equipment. The student will also learn the procedures used to complete the machining of cylinder heads and component

parts. A discussion of high performance and production differences will complete this section. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### 207 CYLINDER HEAD AND COMPONENT MACHINING (90/105/9.5)

Actual hands-on cylinder head and component machining will be accomplished by each student as they become proficient with all machining operations. Machined components will be checked closely for accuracy. These pieces will become part of each student's course project. Outside-the-classroom work is required. This course includes an average of 48.75 hours of outside the classroom work.

### 208 CYLINDER HEAD BLUEPRINTING (30/15/12.5)

The student is exposed to the art of creating maximum efficiency and horsepower through precision component assembly relationships. Combustion chamber sizing and compression ratios will be discussed. The student will also study cylinder head performance secrets. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

### 209 CYLINDER HEAD ASSEMBLY (30/60/4.0)

The student will learn how to assemble the precisely machined components into a complete cylinder head. This is covered in detail. Evaluation and testing of complete assemblies will reveal the relationship of changes to performance. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside the classroom work.

### 210 CYLINDER HEAD PORTING (30/75/4.5)

The student will explore flow characteristics of various head designs and the resultant effects of change. Proper porting technique, when it should be used, and how it should be used, is covered. The actual hands-on experience will illustrate methods and levels of airflow improvement. Outside-the-classroom work is required. This course includes an average of 26.25 hours of outside the classroom work.

### 212 CYLINDER HEAD CAREER PLANNING (15/0/1.0)

The student is prepared to enter the work force by learning the importance of personal appearance, conduct, attitude, and mechanical aptitude. Job search techniques, the application process, effective resume composition, and interviewing skills are covered. Career goal setting, steps toward self-employment, and job placement assistance is covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

## PROGRAM OBJECTIVES:

The program objective for the CNC Machining course is to qualify the student as a CNC automotive machinist, to be capable of understanding and performing machining operations utilizing Computer Numerically Controlled Machining Centers. This program is to provide an opportunity for a student to achieve an entry level skilled trade in the automotive field. This program is intended for the mechanically inclined student with a desire to work in the automotive industry. The program will include both classroom and hands-on lab instruction. The School of Automotive Machinists & Technology measures student progress in semester credit hours. One semester credit hour for each fifteen (15) hours of classroom contact plus appropriate outside preparation or the equivalent; or one semester credit hour for each thirty (30) hours of laboratory work plus appropriate outside preparation. This program has an outside work requirement for completion. Please see the course descriptions for additional information. The primary emphasis of this program will be the application of CNC machining techniques to improve performance of cylinder heads and engine blocks. The student will thoroughly learn and explore the utilization of 5-Axis CNC Machining Centers as well as Coordinate Measuring Machine digitizing hardware and software applications and interfacing. Machine set-up, operation, and work piece preparation will be covered in detail. Special emphasis will be given to modification of high-performance and racing cylinder heads. The student will analyze and evaluate completed projects to quantify improvements, using racing industry standard equipment and techniques. Graduates will benefit from improved opportunities for employment in all forms of the motorsports industry. Single subjects making up this program are not offered individually. See Equipment List Addendum for a complete list of machines used in the CNC Machining Program.



CNC machine programming

## CNC ADMISSIONS REQUIREMENTS:

Program applicants are required to:

1. Present proof of secondary education (high School diploma or GED certificate) and at least 18 years of age.
2. Be computer literate and familiar with Microsoft® Windows XP or later.
3. Achieve a passing score on the SAM Tech Math Proficiency Test (a passing score of 75%), as a CNC Program entrance exam.
4. Achieve a passing score on the Bennett Mechanical Comprehension Test (a passing score of 39 which is the mean score of 12th grade students), as an entrance exam.

### TEXAS WORKFORCE COMMISSION

COURSE	TITLE	THEORY	LAB	SEM HRS	ACCSC		TOTAL CLOCK HRS
					THEORY	LAB	
301	Work Practices, Tools, and Safety	2.0	0.0	2.0	30	0.0	30
302	Introduction and Basic Machine Overview	2.0	1.0	3.0	30	30.0	60
303*	Introduction to CAM Software	7.0	2.0	9.0	105	60.0	165
304*	Digitizing Techniques and Applications	4.0	2.0	6.0	60	61.0	121
305*	Machine, Fixtures, and Component Preparation	1.0	2.0	3.0	15	60.0	75
306*	Machining Operations - Engine Block	1.0	2.0	3.0	15	60.0	75
307*	Machining Operations – Cylinder Head	1.0	2.0	3.0	15	60.0	75
308*	Inspection and Analysis of Machined Parts	1.0	1.0	2.0	15	30.0	45
<b>Totals</b>		<b>19.0</b>	<b>12.0</b>	<b>31.0</b>	<b>285</b>	<b>361.0</b>	<b>646 **</b>

\* Requires 301 and 302 as prerequisites

\*\* Outside work is not included

The approximate time to complete this program is thirty (30) weeks (day) and thirty-seven (37) weeks (night). The total program weeks do not include school breaks.

## COURSE DESCRIPTIONS/SYNOPSIS

### CNC 301 WORK PRACTICES, TOOLS & SAFETY (30/0/2)

This course provides a general introduction to the industry working environment including customer relations, work orders, build sheets, and parts acquisition. Familiarization with the use of basic hand tools, specialized tools, and precision measurement tools will be covered. Special emphasis is placed on both personal and shop safety due to the nature of potentially hazardous equipment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### CNC 302 INTRODUCTION AND BASIC MACHINE OVERVIEW (30/30/3)

The student will learn the general operation and maintenance of CNC equipment. Familiarization with the capabilities of this equipment and applications in the racing industry will be covered. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### CNC 303 INTRODUCTION TO CAM SOFTWARE (105/60/9)

The student will learn the CNC machining equipment operation using Computer Aided Manufacturing software to generate CNC control program code. The student will explore the interaction between CAM software, CNC controller, and digitizing equipment. Outside-the-classroom work is required. This course includes an average of 30 hours of outside the classroom work.

**CNC 304 DIGITIZING TECHNIQUES AND APPLICATIONS (60/61/6)** Once optimum component designs have been achieved through conventional modification techniques, the part will be “digitized” using a Coordinate Measurement Machine. The student will learn component improvements using CAM software. Component will be evaluated and analyzed prior to additional machining operations. Outside-the-classroom work is required. This course includes an average of 22.75 hours of outside the classroom work.

### CNC 305 MACHINE, FIXTURES, AND COMPONENT PREPARATION (15/60/3)

The student will learn the set-up of the machine for specific components and operations. Special purpose fixture fabrication and utilization will be learned. Proper fixture installation and work piece preparation to ensure accuracy and repeatability of machining operations will be thoroughly discussed and applied. Outside-the-classroom work is required. This course includes an average of 18.75 hours of outside the classroom work.

### CNC 306 MACHINING OPERATIONS - ENGINE BLOCK (15/60/3)

Actual machining operations are the primary focus of this course. The student will learn to be proficient through hands-on machining procedures of engine blocks and components. Finished work will be thoroughly inspected for accuracy and quality. Outside-the-classroom work is required. This course includes an average of 18.75 hours of outside the classroom work.

### CNC 307 MACHINING OPERATIONS - CYLINDER HEAD (15/60/3)

The student will perform actual machining operations on cylinder heads and components. The focus will be to ensure that each student is proficient in these procedures through inspection of finished work to verify accuracy and quality. Outside-the-classroom work is required. This course includes an average of 18.75 hours of outside the classroom work.

### CNC 308 INSPECTION & ANALYSIS OF MACHINED PARTS (15/30/2)

The student will learn to evaluate and compare completed components against established standards. Special emphasis will be placed on effectiveness of head modifications, using flow testing, and other measurements. The possibility of further performance improvements will be analyzed. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

# 11 AUTOMOTIVE ENGINE/BLOCK & CYLINDER HEAD MACHINING

## PROGRAM OBJECTIVES: CYLINDER HEAD MACHINING

The program objective of Automotive Engine/Block and Cylinder Head Machining is to qualify the student as an automotive block and cylinder head machinist. This program is to provide an opportunity for a student to achieve an entry level skilled trade in the automotive field. Although the actual machining processes will be the major emphasis of the program, a thorough education on the theory of operation of the modern automotive engine will be presented along with the role of the cylinder head to the complete assembly. Performance modifications effects on power, longevity, and airflow characteristics will be highlighted in all courses of this program. The program is intended for the mechanically inclined student with a desire to work in the high performance/racing industry. The program will include both classroom and hands-on lab instruction. The School of Automotive Machinists & Technology measures student progress in semester credit hours. One semester credit hour for each fifteen (15) hours of classroom contact plus appropriate outside preparation or the equivalent; or one semester credit hour for each thirty (30) hours of laboratory work plus appropriate outside preparation. This program has an outside work requirement for completion. Please see the course descriptions for additional information. Single subjects making up this program are not offered individually. The students will learn performance machining operation skills on industry standard machines, a boring bar, Sunnen cylinder hones, align hone and rod resizer, as well as a SuperFlow dynamometer, DynoJet chassis dynamometer, Sunnen surfacer, seat and guide machine, valve guide workstation, and SuperFlow flow bench. See Equipment List Addendum for a complete list of machines used in the Block Machining and Cylinder Head Machining Program.



Students adjusting throttle linkage

TEXAS WORKFORCE COMMISSION

COURSE	TITLE	THEORY	LAB	SEM HRS	ACCSC		TOTAL CLOCK HOURS	
					THEORY	LAB		
101	Work Practices, Tools, & Safety	1.0	0.5	1.5	15.0	15.0	30.0	
102	Machinists Math & Measurement Inspection	3.0	0.5	3.5	45.0	15.0	60.0	
103*	Principles & Theories/Internal Engine (Oiling & Gaskets)	2.0	0.0	2.0	30.0	0.0	30.0	
104*	Dyno Operations	1.0	0.0	1.0	15.0	0.0	15.0	
105*	Engine Block Blueprinting	1.0	0.0	1.0	15.0	0.0	15.0	
106*	Balancing of Crankshafts, Rods & Pistons	2.0	0.5	2.5	30.0	15.0	45.0	
107*	Block Camshafts & Valve Train Technologies	5.5	0.5	6.0	82.5	15.0	97.5	
108*	Engine Bearing Fundamentals	2.0	0.0	2.0	30.0	0.0	30.0	
109*	Analysis of Pistons & Rings	3.0	0.0	3.0	45.0	0.0	45.0	
110*	Fuel Systems, Ignitions, Power Speed Calculator & Weather Station	2.0	0.0	2.0	30.0	0.0	30.0	
111*	Design & Function of Engine Block Components	2.0	0.0	2.0	30.0	4.25	34.25	
112*	Filing Rings, Gap Requirements & Oil Tension	1.0	0.0	1.0	15.0	4.0	19.0	
113*	The Effects of Honing with Profilometer	1.0	0.0	1.0	15.0	4.25	19.25	
114*	Engine Block Teardown & Math Refresher	0.0	0.5	0.5	0.0	15.0	15.0	
115*	Operation of Engine Block Machining Equipment	1.0	3.0	4.0	15.0	90.0	105.0	
116*	Engine Block Assembly (Blue Printing & Cam Degreeing)	2.0	1.0	3.0	30.0	60.0	90.0	
117*	Dyno Testing	1.0	0.5	1.5	15.0	15.0	30.0	
201	Cylinder Head Work Practices, Tools, and Safety	2.0	0.0	2.0	30.0	0.0	30.0	
202	Cylinder Head Machinist Math and Measurement	3.0	0.5	3.5	45.0	15.0	60.0	
203*	Principles and Theories of Engine Cylinder Head	2.0	0.0	2.0	30.0	5.0	35.0	
204*	Design and Function of Cylinder Head Components	2.0	0.0	2.0	30.0	0.0	30.0	
205*	Cylinder Head Disassembly and Inspection	3.0	0.5	3.5	45.0	15.0	60.0	
206*	Operation of Cylinder Head Machining Equipment	3.0	0.5	3.5	45.0	15.0	60.0	
207*	Cylinder Head and Component Machining	6.0	3.5	9.5	90.0	105.0	195.0	
208*	Cylinder Head Blueprinting	2.0	0.5	2.5	30.0	15.0	45.0	
209*	Cylinder Head Assembly	2.0	2.0	4.0	30.0	60.0	90.0	
210*	Cylinder Head Porting	2.0	2.5	4.5	30.0	75.0	105.0	
212*	Career Development Planning	2.0	0.0	2	30.0	0.0	30.0	
		<b>Totals</b>	<b>31.5</b>	<b>17.0</b>	<b>38.5</b>	<b>892.5</b>	<b>557.5</b>	<b>1450.0**</b>

\*Requires 101, 102, 201, and 202 as prerequisites

\*\* Outside work is not included

The approximate time to complete this program is seventy-two (72) weeks (day) and ninety (90) weeks (night). The total program weeks do not include school breaks.

### COURSE DESCRIPTIONS/SYNOPSIS

#### 101 ENGINE BLOCK ENGINE WORK PRACTICES, TOOLS, AND SAFETY (15/15/1.5)

The student will gain a general introduction to the industry work environment including customer relations, work orders, build sheets, and block parts acquisition. The student will be introduced to the use of precision measurement and the required specialized, as well as basic hand tools. Special emphasis is placed on personal and shop safety due to the nature of potentially hazardous equipment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

#### 102 ENGINE BLOCK MACHINIST MATH AND MEASUREMENT (45/15/3.5)

The student will learn procedures of careful inspection and precise measurement technologies, combined with the proper applications, formulas, and machinist math, to provide a solid basis for successful production and high performance engine assembly procedures. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

#### 103 PRINCIPLES AND THEORIES OF ENGINE BLOCK (30/0/2.0)

The student will explore the basic theory and concepts of internal combustion engine operation, and then move into more specific and complex areas including torque, airflow, volumetric efficiency, operating cycles, and horsepower. Outside-the-classroom work is required. This course includes an average of 8.75 hours of outside the classroom work.

#### 104 DYNO OPERATIONS (15/0/1.0)

The student will learn the operation of an engine dynamometer to confirm performance modifications and durability. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

#### 105 ENGINE BLOCK BLUEPRINTING (15/0/1.0)

The student will learn the art of producing maximum capable horsepower including; torque, volumetric efficiency, and RPM through precise component assembly. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

#### 106 BALANCING OF CRANKSHAFTS (30/15/2.5)

The student will learn and practice the key elements of balancing a rotating assembly to insure the crankshaft counterweights offset the rotating and recipitating forces created by pistons and rods. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

#### 107 ENGINE BLOCK CAMSHAFTS AND VALVE TRAIN TECHNOLOGIES (82.5/15/6.0)

The student learns the effects of camshaft selection, degreeing, and valve timing in relation to cylinder pressure, will be studied. Outside-the-classroom work is required. This course includes an average of 25.75 hours of outside the classroom work.

#### 108 ENGINE BEARING FUNDAMENTALS (30/0/2.0)

Students will learn material selection, clearance, and proper assembly of the internal combustion engine bearings and modifications for high load/high RPM's racing engines. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

# **AUTOMOTIVE ENGINE/BLOCK & CYLINDER 12**

## **HEAD MACHINING**

### **109 PISTONS AND RINGS (45/0/3.0)**

The students learn the understanding of the relationship between pistons and rings as used in the high-performance engine application. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

### **111 DESIGN AND FUNCTION OF ENGINE BLOCK COMPONENTS (30/4.25/2.0)**

The student will learn the individual components, their function, design, material composition, and differences. This includes the relationship of the individual pieces to each other and the assembly as a whole. Production and performance variations will also be discussed. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### **112 FILING RINGS, GAP REQUIREMENTS AND OIL TENSION (15/4.0/1.0)**

Ring filing to set gaps for specific engine power ranges and race applications. Ring fitting in actual finished cylinders is included. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### **113 THE EFFECTS OF HONING UTILIZING A PROFILOMETER (15/4.25/1.0)**

Students will learn to calculate four different cylinder wall measurements Average Roughness (Ra), Core Roughness (Rk), Reduced Pick Height (Rpk), and Reduced Valley Depth (Rvk). Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### **114 ENGINE BLOCK TEARDOWN AND MATH REFRESHER (.5/15/0.5)**

The student learns the techniques of thorough examination and evaluation during disassembly to correctly diagnose potential problems, engine failure, and component replacement. Cleaning methods for both cast iron and aluminum are covered, including the impact of current environmental concerns. Additionally, crack detection methods and casting repairs are also covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### **115 OPERATION OF ENGINE BLOCK MACHINING EQUIPMENT (15/90/4.0)**

The student learns the set-up and operation procedures for the machining equipment. They will also learn the procedures used to complete the machining of block and component parts. The differences between standard and high-performance applications will be highlighted. Outside-the-classroom work is required. This course includes an average of 26.25 hours of outside the classroom work.

### **116 ENGINE BLOCK ASSEMBLY (BLUE PRINTING AND CAM DEGREEING (30/60/3.0)**

The primary focus of this course is mastering the art of assembling precisely machined components into a complete operating engine, not only basic rebuild practices but blue printing specifications for different horsepower levels. The student will learn cam degreeing with consideration of application and referencing piston to valve clearance. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside the classroom work.

### **117 DYNO TESTING (15/15/1.5)**

The student will experience setting up and running an engine dynamometer. This will include engine break-in, optimization of torque & horsepower while monitoring ignition timing and air fuel ratio. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### **118 ENGINE BLOCK CAREER PLANNING (15/0/1.0)**

The student is prepared to enter the work force by learning the importance of personal appearance, conduct, attitude and mechanical aptitude. Job search techniques, the application process, effective resume composition, and interviewing skills are covered. Career goal setting, steps toward self-employment, and job placement assistance is covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### **201 CYLINDER HEAD WORK PRACTICES, TOOLS, AND SAFETY (30/0/2.0)**

The student will gain a general introduction to the industry work environment including customer relations, work orders, build sheets, and cylinder head parts acquisition. The student will be introduced to the use of precision measurement and the required specialized, as well as basic hand tools. Special emphasis is placed on personal and shop safety due to the nature of potentially hazardous equipment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### **202 CYLINDER HEAD MACHINIST MATH AND MEASUREMENT (45/15/3.5)**

The student will learn procedures of careful inspection and precise measurement technologies, combined with the proper applications, formulas, and machinist math to provide a solid basis for successful production and high performance cylinder head assembly procedures. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### **203 PRINCIPLES AND THEORIES OF ENGINE CYLINDER HEAD (30/5/2.0)**

The student will learn the basic theory and concepts of internal combustion engine operation. The course then moves into more specific and complex areas including torque, airflow, volumetric efficiency, operating cycles, and horsepower. Outside-the-classroom work is required. This course includes an average of 8.75 hours of outside the classroom work.

### **204 DESIGN AND FUNCTION OF CYLINDER HEAD COMPONENTS (30/0/2.0)**

The student will learn the how and why of the many components of cylinder head assembly and their relationship to each other. The function and various material compositions of cylinder head castings and components will also be covered. Standard and high performance differences will be discussed. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### **205 CYLINDER HEAD DISASSEMBLY AND INSPECTION (45/15/3.5)**

The student will learn the proper procedure of head disassembly and careful inspection to determine any causes of failure, repair needs, and component replacement. Cleaning methods, crack detection, repair, and associated environmental issues, for both aluminum and iron heads, will also be discussed. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### **206 OPERATION OF CYLINDER HEAD MACHINING EQUIPMENT (45/15/3.5)**

The student learns the set-up and operation procedures of machining equipment. The student will also learn the procedures used to complete the machining of cylinder heads and component parts. A discussion of high performance and production differences will complete this section. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### **207 CYLINDER HEAD AND COMPONENT MACHINING (90/105/9.5)**

Actual hands-on cylinder head and component machining will be accomplished by each student as they become proficient with all machining operations. Machined components will be checked closely for accuracy. These pieces will become part of each student's course project. Outside-the-classroom work is required. This course includes an average of 48.75 hours of outside the classroom work.

### **208 CYLINDER HEAD BLUEPRINTING (30/15/2.5)**

The student is exposed to the art of creating maximum efficiency and horsepower through precision component assembly relationships. Combustion chamber sizing and compression ratios will be discussed. The student will also study cylinder head performance secrets. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

### **209 CYLINDER HEAD ASSEMBLY (30/60/4.0)**

The student will learn how to assemble the precisely machined components into a complete cylinder head. This is covered in detail. Evaluation and testing of complete assemblies will reveal the relationship of changes to performance. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside the classroom work.

### **210 CYLINDER HEAD PORTING (30/75/4.5)**

The student will explore flow characteristics of various head designs and the resultant effects of change. Proper porting technique, when it should be used, and how it should be used, is covered. The actual hands-on experience will illustrate methods and levels of airflow improvement. Outside-the-classroom work is required. This course includes an average of 26.25 hours of outside the classroom work.

### **212 CAREER DEVELOPMENT PLANNING (30/0/2.0)**

The student is prepared to enter the work force by learning the importance of personal appearance, conduct, attitude and mechanical aptitude. Job search techniques, the application process, effective resume composition, and interviewing skills are covered. Career goal setting, steps toward self-employment, and job placement assistance is covered. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

# 13 EFI CALIBRATION

## PROGRAM OBJECTIVES:

The program objective for the EFI Calibration program is to prepare the student for entry into the tuning industry, to be capable of calibrating and troubleshooting the Engine Management System on the engine dynamometer, chassis dynamometer and at the race track. This program is to provide an opportunity for a student to achieve an entry level skilled trade in the automotive field. This program includes instruction in adding performance accessories, modifying power trains, tuning custom engines, suspension, exhaust systems, and using dynamometers and other diagnostic equipment. This program is intended for mechanically inclined students with a solid background in the mechanical system of an automotive engine and desire to extend that knowledge into the electronic control system in the automotive industry. The program will include both classroom and hands-on lab instruction. The School of Automotive Machinists & Technology measures student progress in semester credit hours. One semester credit hour for each fifteen (15) hours of classroom contact plus appropriate outside preparation or the equivalent; or one semester credit hour for each thirty (30) hours of laboratory work plus appropriate outside preparation. This program has an outside work requirement for completion. Please see the course description for additional information. The primary emphasis of this program will be on both the science and the analytical method used to extract the maximum performance out of an engine safely. The student will learn and explore how to utilize various engine control software and dynamometers to alter engine operating parameters while observing the physical changes in real time. Special tuning topics such as High Performance Naturally Aspirated, Turbo Charged, Supercharged, Nitrous, Launch Control, and Traction Control will be covered in detail. The student will learn to analyze and evaluate completed projects to quantify improvements, using racing industry standard equipment and techniques. Graduates will benefit from improved opportunities for employment in all forms of the motorsports industry. Single subjects making up this program are not offered individually. See Equipment List Addendum for a complete list of machines used in the EFI Calibration program.



EFI Calibration

## EFI CALIBRATION ADMISSIONS REQUIREMENTS:

Program applicants are required to:

1. Present proof of secondary education (high school diploma or GED certificate) and be at least 18 years of age.
2. Be computer literate and familiar with Microsoft Windows 7 or later.
3. Achieve a passing score on the Bennett Mechanical Comprehensive Test (a passing score of 39 which is the mean score of 12<sup>th</sup> grade students), as an entrance exam.

COURSE TITLE	TEXAS WORKFORCE COMMISSION			ACCSC		TOTAL CLOCK HRS	DEPARTMENT OF EDUCATION
	THEORY	LAB	SEM HRS	THEORY	LAB		(Used for Title IV Funding) SEMESTER HRS
EFI 501 Introduction to EFI Calibration, Tools, Systems & Safety	2.3	0.0	2.3	35.0	0.0	35.0	1.0
EFI 502 Engine Calibration Concepts and Theory	2.0	1.0	3.0	30.0	30.0	60.0	2.0
EFI 503 Understanding of Basic Electronics	4.0	1.0	5.0	60.0	30.0	90.0	3.0
EFI 504 Dynamometer Operations	1.0	2.0	3.0	15.0	60.0	75.0	2.5
EFI 505 Stock Computer Training & Engine Diagnostics	6.0	2.0	8.0	90.0	60.0	150.0	5.0
EFI 506 Aftermarket Advanced Electronics	4.0	2.0	6.0	60.0	60.0	120.0	4.0
EFI 507 Data Collection, Analysis, & Track Calibration	2.0	2.0	4.0	30.0	60.0	90.0	3.0
<b>Totals</b>	<b>21.3</b>	<b>10.0</b>	<b>31.3</b>	<b>320.0</b>	<b>300.0</b>	<b>620.0*</b>	<b>20.5 = 20</b>

The U.S. Department of Education does not round

\* Outside work is not included

The approximate time to complete this program is thirty (30) weeks. The total program weeks do not include school breaks.

## COURSE DESCRIPTIONS/SYNOPSIS

### EFI 501 INTRODUCTION TO EFI CALIBRATION, TOOLS, SYSTEMS AND SAFETY (35/0/2)

The student will gain working knowledge of the different types of EFI systems, software and other tools used to assist in engine vehicle tuning. Students will learn practices that will influence safety for themselves and others due to the nature of the potentially hazardous environment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside-the-classroom work.

### EFI 502 ENGINE CALIBRATION CONCEPTS AND THEORY (30/30/3)

The student will learn how to differentiate between the various types of systems and how they differ in tuning strategies. They also learn what is involved in fuel and ignition tuning, open and closed loop tuning and functions of PID controllers as well as possible secondary systems that may be controlled by the computer. Combustion chemistry, emission control, and fuel difference is also covered. Outside-the-classroom work is required. This course includes an average of 15 hours of outside-the-classroom work. Prerequisite 501

### EFI 503 UNDERSTANDING OF BASIC ELECTRONICS (60/30/5)

This course explains the different types of sensors that are used to provide feedback to the computer accompanied by how they work. Students will learn what sensors are appropriate to use in specific applications. They will also learn how to diagnosis possible issues. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside-the-classroom work. Prerequisite 501 - 502

### EFI 504 DYNAMOMETER OPERATIONS (15/60/3)

Students will learn to set-up an engine/vehicle on the engine and chassis dynamometer. They will learn the safety requirements to operate these dynamometers and understand how the function of each. Student will practice tuning on the engine and chassis dynamometer. Outside-the-classroom work is required. This course includes an average of 18.75 hours of outside-the-classroom work. Prerequisite 501 - 503

### EFI 505 STOCK COMPUTER TRAINING AND ENGINE DIAGNOSTICS (90/60/8)

Students will learn strategies of tuning factory computer systems using HPTuners. They will learn to improve OEM mapping for better drivability tuning along with transmission tuning and engine diagnostics. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside-the-classroom work. Prerequisite 501 - 504

### EFI 506 AFTERMARKET ADVANCED ELECTRONICS (60/60/6)

Students will learn how to install aftermarket engine management systems. They will also learn how to diagnose issues and make modifications. Outside-the-classroom work is required. This course includes an average of 18.75 hours of outside-the-classroom work. Prerequisite 501 - 505

### EFI 507 DATA COLLECTION, ANALYSIS, AND TRACK CALIBRATION (30/60/4)

Students learn about the effects that changing track and weather conditions will have on a tune and how making adjustments will best suit the current conditions based on driver feedback, ET/mph and data logs. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside-the-classroom work. Prerequisite 501 - 506

# ASSOCIATE OF APPLIED SCIENCE DEGREE IN 14 AUTOMOTIVE ENGINE/BLOCK & CYLINDER HEAD MACHINING

## PROGRAM OBJECTIVES

The program objective of the Automotive Engine/Block and Cylinder Head Machining is to qualify the student as an automotive block and cylinder head machinist. This program is to provide an opportunity for a student to achieve an entry level skilled trade in the automotive field. Students take five general education courses, in addition to the technical courses, to complete the degree. Although the actual machining processes will be the major emphasis of the program, a thorough education on the theory of operation of the modern automotive engine will be presented along with the role of the cylinder head to the complete assembly. Performance modifications effects on power, longevity, and airflow characteristics will be highlighted in all courses of this program. The program is intended for the mechanically inclined student with a desire to work in the high performance/ racing industry. The program will include both classroom and hands-on lab instruction. The School of Automotive Machinists & Technology measures student progress in semester credit hours. One semester credit hour for each fifteen (15) hours of classroom contact plus appropriate outside preparation or the equivalent; or one semester credit hour for each thirty (30) hours of laboratory work plus appropriate outside preparation. Single subjects making up this program are not offered individually. The students will learn performance machining operation skills on industry standard machines, a boring bar, Sunnen cylinder hones, align hone and rod resizer, as well as a SuperFlow dynamometer, DynoJet chassis dynamometer, Sunnen surfacer, seat and guide machine, valve guide workstation, and SuperFlow flow bench. Outside the classroom work is required. See Equipment List Addendum for a complete list of machines used in the Block Machining and Cylinder Head Machining Program.



Students adjusting throttle linkage

## TEXAS WORKFORCE COMMISSION

COURSE	TITLE	ACCSC			TOTAL CLOCK HOURS		
		THEORY	LAB	SEM HRS	THEORY	LAB	
101	Work Practices, Tools, & Safety	1.0	0.5	1.5	15.0	15.0	30.0
102	Machinists Math & Measurement Inspection	3.0	0.5	3.5	45.0	15.0	60.0
103	Principles & Theories/Internal Engine (Oiling & Gaskets)	2.0	0.0	2.0	30.0	0.0	30.0
104	Dyno Operations	1.0	0.0	1.0	15.0	0.0	15.0
105	Engine Block Blueprinting	1.0	0.0	1.0	15.0	0.0	15.0
106	Balancing of Crankshafts, Rods & Pistons	2.0	0.5	2.5	30.0	15.0	45.0
107	Block Camshafts & Valve Train Technologies	5.5	0.5	6.0	82.5	15.0	97.5
108	Engine Bearing Fundamentals	2.0	0.0	2.0	30.0	0.0	30.0
109	Analysis of Pistons & Rings	3.0	0.0	3.0	45.0	0.0	45.0
110	Fuel Systems, Ignitions, Power Speed Calculator & Weather Station	2.0	0.0	2.0	30.0	0.0	30.0
111	Design & Function of Engine Block Components	2.0	0.0	2.0	30.0	4.25	34.25
112	Filing Rings, Gap Requirements & Oil Tension	1.0	0.0	1.0	15.0	4.0	19.0
113	The Effects of Honing with Profilometer	1.0	0.0	1.0	15.0	4.25	19.25
114	Engine Block Teardown & Math Refresher	0.0	0.5	0.5	0.0	15.0	15.0
115	Operation of Engine Block Machining Equipment	1.0	3.0	4.0	15.0	90.0	105.0
116	Engine Block Assembly (Blue Printing & Cam Degreeing)	2.0	1.0	3.0	30.0	60.0	90.0
117	Dyno Testing	1.0	0.5	1.5	15.0	15.0	30.0
201	Cylinder Head Work Practices, Tools, and Safety	2.0	0.0	2.0	30.0	0.0	30.0
202	Cylinder Head Machinist Math and Measurement	3.0	0.5	3.5	45.0	15.0	60.0
203	Principles and Theories of Engine Cylinder Head	2.0	0.0	2.0	30.0	5.0	35.0
204	Design and Function of Cylinder Head Components	2.0	0.0	2.0	30.0	0.0	30.0
205	Cylinder Head Disassembly and Inspection	3.0	0.5	3.5	45.0	15.0	60.0
206	Operation of Cylinder Head Machining Equipment	3.0	0.5	3.5	45.0	15.0	60.0
207	Cylinder Head and Component Machining	6.0	3.5	9.5	90.0	105.0	195.0
208	Cylinder Head Blueprinting	2.0	0.5	2.5	30.0	15.0	45.0
209	Cylinder Head Assembly	2.0	2.0	4.0	30.0	60.0	90.0
210	Cylinder Head Porting	2.0	2.5	4.5	30.0	75.0	105.0
212	Career Development Planning	2.0	0.0	2	30.0	0.0	30.0
ENGL01	* English Composition	3.0	0.0	3	45.0	0.0	45.0
COM101	* Introduction to Communication	3.0	0.0	3	45.0	0.0	45.0
SOC101	* Introduction to Sociology	3.0	0.0	3	45.0	0.0	45.0
MTH101	* College Algebra	3.0	0.0	3	45.0	0.0	45.0
PHY101	* Introduction to Physics	3.0	1.0	4	45.0	30.0	75.0
<b>Totals</b>		<b>74.5</b>	<b>18.0</b>	<b>92.5</b>	<b>1117.5</b>	<b>587.5</b>	<b>1705.0**</b>

\* Requires 101 through 210 as prerequisites

\*\* Outside work is not included

The approximate time to complete this program is one hundred (100) weeks (day) and one hundred nineteen (119) weeks (night).

The total program weeks does not include school breaks.

## COURSE DESCRIPTIONS/SYNOPSIS

### 101 ENGINE BLOCK ENGINE WORK PRACTICES, TOOLS, AND SAFETY (15/15/1.5)

The student will gain a general introduction to the industry work environment including customer relations, work orders, build sheets, and block parts acquisition. The student will be introduced to the use of precision measurement and the required specialized, as well as basic hand tools. Special emphasis is placed on personal and shop safety due to the nature of potentially hazardous equipment. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

### 102 ENGINE BLOCK MACHINIST MATH AND MEASUREMENT (45/15/3.5)

The student will learn procedures of careful inspection and precise measurement technologies, combined with the proper applications, formulas, and machinist math, to provide a solid basis for successful production and high performance engine assembly procedures. Outside-the-classroom work is required. This course includes an average of 15 hours of outside the classroom work.

### 103 PRINCIPLES AND THEORIES OF ENGINE BLOCK (30/0/2.0)

The student will explore the basic theory and concepts of internal combustion engine operation, and then move into more specific and complex areas including torque, airflow, volumetric efficiency, operating cycles, and horsepower. Outside-the-classroom work is required. This course includes an average of 8.75 hours of outside the classroom work.

### 104 DYNO OPERATIONS (15/0/1.0)

The student will learn the operation of an engine dynamometer to confirm performance modifications and durability. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

### 105 ENGINE BLOCK BLUEPRINTING (15/0/1.0)

The student will learn the art of producing maximum capable horsepower including; torque, volumetric efficiency, and RPM through precise component assembly. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

# 15 ASSOCIATE OF APPLIED SCIENCE DEGREE IN **AUTOMOTIVE ENGINE/BLOCK & CYLINDER HEAD MACHINING**

## **106 BALANCING OF CRANKSHAFTS (30/15/2.5)**

The student will learn and practice the key elements of balancing a rotating assembly to insure the crankshaft counterweights offset the rotating and recipitating forces created by pistons and rods. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

## **107 ENGINE BLOCK CAMSHAFTS AND VALVE TRAIN TECHNOLOGIES (82.5/15/6.0)**

The student learns the effects of camshaft selection, degreering, and valve timing in relation to cylinder pressure, will be studied. Outside-the-classroom work is required. This course includes an average of 25.75 hours of outside the classroom work.

## **108 ENGINE BEARING FUNDAMENTALS (30/0/2.0)**

Students will learn material selection, clearance, and proper assembly of the internal combustion engine bearings and modifications for high load/high RPM's racing engines. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

## **109 PISTONS AND RINGS (45/0/3.0)**

The students learn the understanding of the relationship between pistons and rings as used in the high-performance engine application. Outside-the-classroom work is required. This course includes an average of 11.25 hours of outside the classroom work.

## **110 FUEL SYSTEMS, IGNITIONS, POWERSPEED CALCULATOR AND WEATHER STATION (30/0/2.0)**

The student will learn the importance of fueling and igniting the engine cylinders for max reliable power utilizing power speed calculators and weather station data to produce consistent reliable power. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

## **111 DESIGN AND FUNCTION OF ENGINE BLOCK COMPONENTS (30/4.25/2.0)**

The student will learn the individual components, their function, design, material composition, and differences. This includes the relationship of the individual pieces to each other and the assembly as a whole. Production and performance variations will also be discussed. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

## **112 FILING RINGS, GAP REQUIRMENTS AND OIL TENSION (15/4.0/1.0)**

Ring filing to set gaps for specific engine power ranges and race applications. Ring fitting in actual finished cylinders is included. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

## **113 THE EFFECTS OF HONING UTILIZING A PROFILOMETER (15/4.25/1.0)**

Students will learn to calculate four different cylinder wall measurements Average Roughness (Ra), Core Roughness (Rk), Reduced Pick Height (Rp<sub>k</sub>), and Reduced Valley Depth (Rvk). Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

## **114 ENGINE BLOCK TEARDOWN AND MATH REFRESHER (.5/15/0.5)**

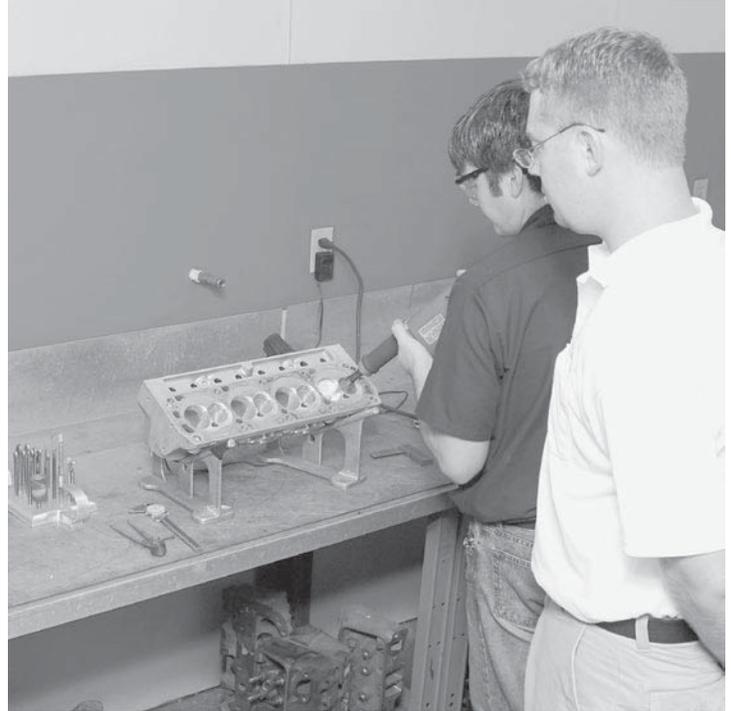
The student learns the techniques of thorough examination and evaluation during disassembly to correctly diagnose potential problems, engine failure, and component replacement. Cleaning methods for both cast iron and aluminum are covered, including the impact of current environmental concerns. Additionally, crack detection methods and casting repairs are also covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

## **115 OPERATION OF ENGINE BLOCK MACHINING EQUIPMENT (15/90/4.0)**

The student learns the set-up and operation procedures for the machining equipment. They will also learn the procedures used to complete the machining of block and component parts. The differences between standard and high-performance applications will be highlighted. Outside-the-classroom work is required. This course includes an average of 26.25 hours of outside the classroom work.

## **116 ENGINE BLOCK ASSEMBLY (BLUE PRINTING AND CAM DEGREEING (30/60/3.0)**

The primary focus of this course is mastering the art of assembling precisely machined components into a complete operating engine, not only basic rebuild practices but blue printing specifications for different horsepower levels. The student will learn cam degreering with consideration of application and referencing piston to valve clearance. Outside-the-classroom work is required. This course includes an average of 22.5 hours of outside the classroom work.



Cylinder head porting

## **117 DYNO TESTING (15/15/1.5)**

The student will experience setting up and running an engine dynamometer. This will include engine break-in, optimization of torque & horsepower while monitoring ignition timing and air fuel ratio. Outside-the-classroom work is required. This course includes an average of 7.5 hours of outside the classroom work.

## **118 ENGINE BLOCK CAREER PLANNING (15/0/1.0)**

The student is prepared to enter the work force by learning the importance of personal appearance, conduct, attitude and mechanical aptitude. Job search techniques, the application process, effective resume composition, and interviewing skills are covered. Career goal setting, steps toward self-employment, and job placement assistance is covered. Outside-the-classroom work is required. This course includes an average of 3.75 hours of outside the classroom work.

## **201 CYLINDER HEAD WORK PRACTICES, TOOLS, AND SAFETY (30/0/2.0)**

The student will gain a general introduction to the industry work environment including customer relations, work orders, build sheets, and parts acquisition. The student will be introduced to the use of precision measurement and specialized, as well as, basic hand tools required will also be covered. Special emphasis is placed on both personal and shop safety due to the nature of potentially hazardous equipment. This course includes an average of 7.5 hours of outside the classroom work.

## **202 CYLINDER HEAD MACHINIST MATH AND MEASUREMENT (45/15/3.5)**

The student will learn the procedures of careful inspection and precise measurement technologies, combined with the proper applications, formulas, and machinist math to provide a solid basis for successful production and high performance engine assembly procedures. This course includes an average of 15 hours of outside the classroom work.

## **203 PRINCIPLES AND THEORIES OF ENGINE CYLINDER HEAD (30/5/2.0)**

The student will learn the basic theory and concepts of internal combustion engine operation. The course then moves into more specific and complex areas including torque, airflow, volumetric efficiency, operating cycles, and horsepower. This course includes an average of 8.75 hours of outside the classroom work.

# ASSOCIATE OF APPLIED SCIENCE DEGREE IN 16 AUTOMOTIVE ENGINE/BLOCK & CYLINDER HEAD MACHINING

## **204 DESIGN AND FUNCTION OF CYLINDER HEAD COMPONENTS (30/0/2.0)**

The student will learn the how and why of the many components of the cylinder head assembly and their relationship to each other. The function and various material compositions of cylinder head castings and components will also be covered. Standard and high performance differences will be discussed. This course includes an average of 7.5 hours of outside the classroom work.

## **205 CYLINDER HEAD DISASSEMBLY AND INSPECTION (45/15/3.5)**

The student will learn the proper procedure of head disassembly and careful inspection to determine any causes of failure, repairs needed, and component replacement. Cleaning methods, crack detection, repair, and associated environmental issues, for both aluminum and iron heads will also be discussed. This course includes an average of 15 hours of outside the classroom work.

## **206 OPERATION OF CYLINDER HEAD MACHINING EQUIPMENT (45/15/3.5)**

The student learns the set-up and operation procedures of machining equipment. The student will also learn the procedures used to complete the machining of cylinder heads and component parts. A discussion of high performance and production differences will complete this section. This course includes an average of 15 hours of outside the classroom work.

## **207 CYLINDER HEAD AND COMPONENT MACHINING (90/105/9.5)**

Actual hands-on cylinder head and component machining will be accomplished by each student as they become proficient with all machining operations. Machined components will be checked closely for accuracy. These pieces will become part of each student's course project. This course includes an average of 48.75 hours of outside the classroom work.

## **208 CYLINDER HEAD BLUEPRINTING (30/15/2.5)**

The student is exposed to the art of creating maximum efficiency and horsepower through precision component assembly relationships. Combustion chamber sizing and compression ratios will be discussed. The student will also study cylinder head performance secrets. This course includes an average of 11.25 hours of outside the classroom work.

## **209 CYLINDER HEAD ASSEMBLY (30/60/4.0)**

The student will learn correct assembly procedures of precisely machined components into a complete cylinder head. Evaluation and testing of complete assemblies will reveal the relationship of changes to performance. This course includes an average of 22.5 hours of outside the classroom work.

## **210 CYLINDER HEAD PORTING (30/75/4.5)**

The student will explore flow characteristics of various head designs and the resultant effects of change. Proper techniques of porting, when it should be used, and actual hands-on experience will illustrate methods and levels of airflow improvement. This course includes an average of 26.25 hours of outside the classroom work.

## **212 CAREER DEVELOPMENT PLANNING (30/0/2.0)**

The student is prepared to enter the job market by learning the importance of personal appearance, conduct, and attitude, in addition to mechanical aptitude. Subjects covered include job search, application process, effective resume composition, and interviews with potential employers. Career goal setting, including steps toward self-employment, along with job placement assistance are also covered. This course includes an average of 7.5 hours of outside the classroom work.

## **ENG 101 ENGLISH COMPOSITION (45/0/3.0)**

This course develops critical reading and writing skills. Through readings and discussion of selected prose works, the student will learn to identify problems, examine possible solutions, recognize unstated assumptions and values, appraise evidence, evaluate arguments, draw inferences, and test conclusions. Through writing, the students will learn to analyze, synthesize, organize information logically, and propose original ideas. Students complete four essays: the narrative, summary, rhetorical analysis, and critical analysis.

**COM 101 INTRODUCTION TO COMMUNICATION (45/0/3.0)** This course introduces basic communication. Students learn how to analyze verbal and nonverbal cues, resolve conflicts, and execute effective business and interpersonal communication. Students demonstrate effective communication skills through written correspondence and oral presentations. Current writings on the subject broaden students' exposure to communication. This course includes an average of 90 hours of outside the classroom work.

## **SOC 101 INTRODUCTION TO SOCIOLOGY (45/0/3.0)**

This course explores sociological processes that underlie everyday life. Topics include globalization, cultural diversity, family, poverty, critical thinking, new technologies, and the growing influence of mass media. This course includes an average of 90 hours of outside the classroom work.

## **MTH 101 COLLEGE ALGEBRA (45/0/3.0)**

This course provides students with an understanding of a wide variety of algebraic concepts and problem-solving methods. Students learn how to solve problems using polynomials, rational expressions, logarithmic and exponential functions, inequalities, systems of equations and inequalities, matrices, determinants, simple linear programming, solutions of higher degree polynomials, combinatorial algebra including the binomial theorem, and probability. Critical thinking skills are developed through the application of algebraic solutions.

## **PHY 101 INTRODUCTION TO PHYSICS (45/30/4.0)**

This is an introductory physics courses. Students learn the basic principles of Newtonian Mechanics and apply those to linear, rotational motion, and harmonic motion. Fluids and thermodynamics are also covered. Students will participate in laboratories to reinforce classroom lectures.

---

*SAM Tech reserves the right to change start dates, fees, and course work subject to appropriate procedures and approval by its regulatory bodies.*

NOTES:

SCHOOL OF AUTOMOTIVE  
MACHINISTS & TECHNOLOGY

# **SAM TECH**

SAMTECH.EDU

1911 Antoine • Houston, Texas 77055

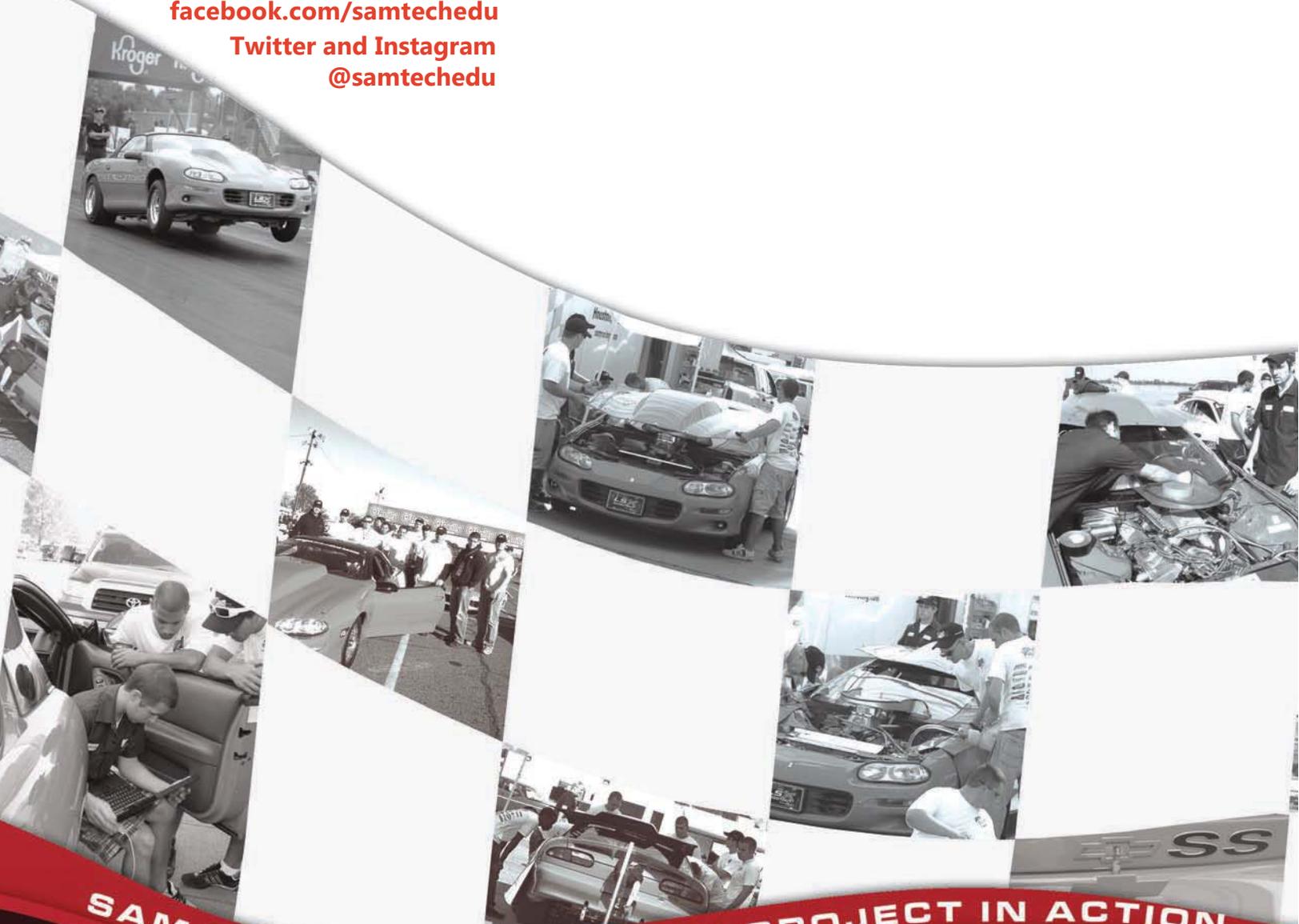
713-683-3817 • Fax 713-683-7077

[samtech.edu](http://samtech.edu)

[facebook.com/samtechedu](https://facebook.com/samtechedu)

Twitter and Instagram

@samtechedu



**SAM TECH STUDENT CLASS PROJECT IN ACTION**

APPROVED AND REGULATED BY THE TEXAS WORKFORCE COMMISSION  
CAREER SCHOOLS AND COLLEGES, AUSTIN, TEXAS  
APPROVED FOR TRAINING OF VA ELIGIBLE PERSONS

# SCHOOL OF AUTOMOTIVE MACHINISTS & TECHNOLOGY

## Supplement A to CATALOG

No. 96

July 21, 2023

### SCHEDULE OF PROGRAMS

- Block Program – Automotive Engine/Block Machining
- Cylinder Head Program – Automotive Engine/Cylinder Head Machining
- Combo Program – Automotive Engine/Block & Cylinder Head Machining  
(This is a combination of the Block and Head Programs listed above)
- Associate of Applied Science Degree in Automotive Engine/Block & Cylinder Head Machining (This is a combination of the Block and Head Programs listed above along with five general education courses)
- CNC Machining Program
- EFI Calibration Program

### IN SERVICE DAYS (No Classes) – 2023

February 20	July 5
May 26	September 1
July 3	October 9

### SCHOOL HOLIDAYS AND BREAKS – 2023

January 1-3	New Year's Day/Winter Break
March 13-17	Spring Break
April 7	Good Friday
May 29	Memorial Day
June 19	Juneteenth Day
July 4	Independence Day
September 4	Labor Day
November 20-24	Thanksgiving Break
December 20-31	Winter Break

January 1-2, 2024

### SCHEDULE OF TUITION

Registration Fee	
Tuition (per program)	
Textbooks & Manuals (call for pricing)*	
Lab Fees	
Length of Program: Approximately 7 Months	
Military TA Rate	Per Clock Hour
14,200.00	21.98
	646

### CNC Machining Program

Registration Fee	100.00
Tuition (per program)	14,200.00
Textbooks & Manuals (call for pricing)*	
Lab Fees	325.00
<b>Total</b>	<b>14,625.00</b>

### SCHEDULE OF TUITION

Registration Fee	
Tuition (per program)	
Textbooks & Manuals (call for pricing)*	
Lab Fees	
Length of Program: Approximately 9 Months	
Military TA Rate	Per Clock Hour
16,300.00	22.48
	725

### Block Program

Registration Fee	100.00
Tuition (per program)	16,300.00
Textbooks & Manuals (call for pricing)*	
Lab Fees	375.00
<b>Total</b>	<b>16,775.00</b>

### SCHEDULE OF TUITION

Registration Fee	
Tuition (per program)	
Textbooks & Manuals (call for pricing)*	
Lab Fees	
Length of Program: Approximately 9 Months	
Military TA Rate	Per Clock Hour
16,000.00	22.07
	725

### Cylinder Head Program

Registration Fee	100.00
Tuition (per program)	16,000.00
Textbooks & Manuals (call for pricing)*	
Lab Fees	1,075.00
<b>Total</b>	<b>17,175.00</b>

### SCHEDULE OF TUITION

Registration Fee	
Tuition (price subject to change if not taken in same calendar year)	
Textbooks & Manuals (call for pricing)*	
Lab Fees	
Length of Program: Approximately 18 Months	
Military TA Rate	Per Clock Hour
32,300.00	22.28
	1450

### Combo Program (Block & Head)

Registration Fee	200.00
Tuition (price subject to change if not taken in same calendar year)	32,300.00
Textbooks & Manuals (call for pricing)*	
Lab Fees	1,450.00
<b>Total</b>	<b>33,950.00</b>

### SCHEDULE OF TUITION

Registration Fee – General Education	
Registration Fee, Tuition, & Lab Fees – Technical Component (Block Program & Head Program or Combo Program) (price subject to change if not taken in same calendar year)	
Tuition – General Education	
Textbooks & Manuals – General Education (call for pricing)*	
Lab Fees	
Length of Program: Approximately 24 Months	
Military TA Rate	Per Semester Hour
38,100.00	414.13
	92

### Associate of Applied Science Degree

Registration Fee	200.00
Registration Fee, Tuition, & Lab Fees – Technical Component (Block Program & Head Program or Combo Program) (price subject to change if not taken in same calendar year)	33,950.00
Tuition – General Education	5,800.00
Textbooks & Manuals – General Education (call for pricing)*	
Lab Fees	100.00
<b>Total</b>	<b>40,050.00</b>

### SCHEDULE OF TUITION

Registration Fee	
Tuition (per program)	
Textbooks & Manuals (call for pricing)*	
Lab Fees	
Length of Program: Approximately 7 Months	
Military TA Rate	Per Clock Hour
13,835.00	22.31
	620

### EFI Calibration Program

Registration Fee	100.00
Tuition (per program)	13,835.00
Textbooks & Manuals (call for pricing)*	
Lab Fees	1,620.00
<b>Total</b>	<b>15,555.00</b>

### SEMINAR FEES:

Taking the Mystery Out of Cam Degreasing and Valve Timing Seminar (non-credit)	400.00
101 High Performance Marketing Seminar (non-credit)	2,000.00
201 Social Media Marketing Seminar (non-credit)	2,000.00

\*No Textbooks required for Seminars

Textbooks & Manuals not included in total cost of program(s)

(Tuition does not include educational field trip expense)

SAM Tech reserves the right to change start dates, fees, and course work subject to appropriate procedures and approval by its regulatory bodies.

## 2023 ENROLLMENT DATES

### BLOCK, CYLINDER HEAD, & COMBO PROGRAMS

Entrance Date	Ending Date	Entrance Date	Ending Date	
January 4, 2023	September 22, 2023	August 1, 2023	May 6, 2024	Head Only
February 7, 2023	October 27, 2023	September 6, 2023	June 12, 2024	Block Only
March 21, 2023	December 7, 2023	September 25, 2023	June 28, 2024	Head Only
April 10, 2023	January 11, 2024	October 10, 2023	July 19, 2024	Block Only
April 24, 2023	January 24, 2024	October 30, 2023	August 7, 2024	Head Only
June 6, 2023	March 6, 2024	November 9, 2023	August 16, 2024	Block Only
June 21, 2023	March 28, 2024	December 11, 2023	September 13, 2024	Head Only
July 11, 2023	April 12, 2024			Block Only

The above entrance and ending dates are for the Block, Head, & Combo Programs only

### CNC MACHINING PROGRAM

ENTRANCE DATE	ENDING DATE
January 30, 2023	August 29, 2023 PM
May 31, 2023	February 2, 2024 AM
September 27, 2023	June 7, 2024 PM

The above entrance and ending dates are for the CNC Machining Program only

### EFI CALIBRATION PROGRAM

ENTRANCE DATE	ENDING DATE
February 1, 2023	August 10, 2023 AM
June 28, 2023	February 22, 2024 PM
November 1, 2023	July 1, 2024 AM

The above entrance and ending dates are for the Motorsports EFI Calibration Program only

Block and Cylinder Head Programs are prerequisites for the General Education Section of the Associate Degree

### GENERAL EDUCATION SECTION

#### ASSOCIATE OF APPLIED SCIENCE DEGREE \*\*

ENTRANCE DATE	ENDING DATE	**All ending dates subject to change due to entering credits
February 2, 2023	September 14, 2023	
April 3, 2023	October 19, 2023	
May 8, 2023	November 30, 2023	
May 30, 2023	January 12, 2024	
July 24, 2023	February 29, 2024	
September 18, 2023	May 2, 2024	
October 23, 2023	June 6, 2024	
December 4, 2023	July 18, 2024	

### 2023 SEMINAR DATES\*\*\*

\*\*\*To be determined: Please contact SAM Tech for More Information

## ADMINISTRATION

John Guyton, EdD	General Education Coordinator/Compliance Coordinator
Kelly Hamilton	Bursar/Accounting Manager/VA School Certifying Official
Kimberly Klevenhagen	Associate Executive Director/Student Services Coordinator/Job Placement/Learning Resource Manager/Alumni Association
Brian Massingill	Vice President Business Development/Admissions Representative/Job Placement Assistant/Alumni Association/Website/Media Tech
Judson Massingill	President/Director of Education
Linda Massingill	CEO/School Executive Director/Administrator
Scott Morris	Admissions Representative
Sheri Rohde	Financial Aid Director
Esther Quintanilla	Administrative Assistant/Learning Resource Assistant/Orientation/Student Services Assistant/VA Student Services
John Walsch	Admissions Representative
Charles White	Admissions Representative

## FACULTY

Judson Massingill	Instructor – Certified, Specialized Training - ITS, 51 years experience BS, Social Science
Jonathan Waitt	Instructor – Certified, Specialized Training, 16 years experience AAS in Automotive Engine/Block & Cylinder Head Machining, Mastercam Instructor Certified
James Maynus	Instructor – Certified, Specialized Training, 13 years experience AAS in Paramedicine, AAS in Fire Science Technology, Holley Certified, Mastercam Certified
Darren Smithers	Instructor – Certified, Specialized Training, 9 years experience BA, Philosophy, AAS in Automotive Engine/Block & Cylinder Head Machining, Holley Instructor Certified, Mastercam Certified
Andrew Hachmeister	Instructor – Certified, Specialized Training, 7 years experience AAS in Automotive Engine/Block & Cylinder Head Machining
Russell Garvin	Instructor – Certified, Specialized Training, 5 years experience AAS in Automotive Engine/Block & Cylinder Head Machining

### ADJUNCT PROFESSORS ARE NOT LISTED

## DRESS CODE

The goal of the School of Automotive Machinists & Technology is to prepare its students to accept a responsible and professional position in the automotive industry. In addition to technical competence, the potential employer will be highly concerned with finding positive attitudes in regards to appearance, dependability, attendance, a good work ethic, and, of course, safety. To this end, the School of Automotive Machinists & Technology has adopted the following dress code for safety and appearance reasons. Failure to abide by this standard may result in a student being asked to leave. The time missed will be considered an unexcused absence.

**SHIRTS:** SAM Tech uniform shirts must be worn at all times while at school. Shirts must be tucked in.

**PANTS:** All students must wear either black, brown, or dark blue Dickie style workpants, cords or blue jeans. Solid shorts are acceptable from May 1st to September 30th. Military pants or athletic apparel are not acceptable.

**SHOES:** Hard leather shoes, boots, athletic safety shoes must be worn at all times while in school.

**CAPS:** Baseball caps are the only hats that can be worn at school. Caps other than those issued by School of Automotive Machinists & Technology must be approved by the administration. Caps must be worn with bill facing forward.

**HAIR LENGTH:** Hair must be cut in such a manner as not to touch the collar of a standard SAM Tech uniform shirt. Hairstyles are at the discretion of the administration.

**MUSTACHES & BEARDS:** Acceptable if neatly trimmed.

**JEWELRY:** Jewelry of any type is not permitted (earrings, body rings, necklaces, etc.)

**SAFETY GLASSES:** Safety glasses required to be worn at all times in all shop/lab areas.

## STUDENT COMPLAINT/GRIEVANCE PROCEDURE:

Please see School Catalog regarding the School of Automotive Machinists & Technology Student Complaint/Grievance Procedure.

Schools accredited by the Accrediting Commission of Career Schools and Colleges must have a procedure and operational plan for handling student complaints. If a student does not feel that the school has adequately addressed a complaint or concern, the student may consider contacting the Accrediting Commission. All complaints reviewed by the Commission must be in written form and should grant permission for the Commission to forward a copy of the complaint to the school for a response. This can be accomplished by filing the ACCSC Complaint Form. The complainant(s) will be kept informed as to the status of the complaint as well as the final resolution by the Commission. Please direct all inquiries to:

Accrediting Commission of Career Schools & Colleges  
2101 Wilson Blvd., Suite 302  
Arlington, VA 22201  
(703) 247-4212  
[www.accsc.org](http://www.accsc.org)

A copy of the ACCSC Complaint Form is available at the school and may be obtained by contacting Linda Massingill, Executive Director, or online at [www.accsc.org](http://www.accsc.org).

The information in this supplement is true and correct to the best of my knowledge.



Executive Director

# SCHOOL OF AUTOMOTIVE MACHINISTS & TECHNOLOGY

## Supplement B to CATALOG

No. 15-A

November 1, 2023

### RETURN OF TITLE IV FUNDS POLICY

Students who receive financial assistance from Title IV programs (Federal Pell Grant, Campus-based Programs, Stafford loans, PLUS loans) and withdraw from School prior to completing more than 60% of the payment period are subject to the Return of Title IV Funds requirements of the U.S. Department of Education. The Return of Title IV Funds procedure is as follows:

1. Determine the percentage of the payment period the student completed. For credit hour programs, the law defines this percentage based on calendar days up to and including the student's last date of attendance is divided by the number of days in the payment period.
  - A payment period is 19 semester credit hours for Automotive Engine/Block Machining, Automotive Engine/Cylinder Head Machining and Automotive Engine/Block & Cylinder Head Machining programs.
  - A payment period is 8 semester credit hours for Associate of Applied Science Degree in Automotive Engine/Block & Cylinder Head Machining.
  - A payment period is 11.5 semester credit hours for CNC Machining.
  - A payment period is 10.5 semester credit hours for Motorsports Welding.
  - A payment period is 10 semester credit hours for EFI Calibration.

The total number of calendar days in the payment period does not include any days in which the student was on an approved leave of absence. In addition, the period does not include breaks of 5 or more days

2. Determine the amount of aid earned by the student. The amount of aid the student earned for the payment period is determined by multiplying the percentage derived from Step 1 by the total amount of Title IV aid that was disbursed or that could have been disbursed as of the student's withdrawal date.
3. Compare the amount earned to the amount disbursed. If the student has a current balance of tuition and/or fees the School would receive the refund before the student. If less aid was disbursed than was earned, the student may receive a post withdrawal disbursement for the difference. If more aid was disbursed than was earned, the difference is refunded back to Title IV programs.
4. Allocate responsibility for returning unearned aid between the School and the student. Students who receive living expenses would be responsible for repayment of any unearned aid. If the student's share of the unearned funds that must be returned are attributed to a Title IV Loan program, then repayment will still be based under the terms and conditions of the promissory note. If the student's share of the unearned funds that must be returned are attributed to a Title IV Grant program, the initial amount to return will be reduced by 50%.
5. Distribute the unearned aid back to the Title IV programs.
6. If a post withdrawal disbursement is due (Box J of the Return to Title IV calculation) the School will notify the student, or parent in case of a PLUS loan, within 30 days. The student or parent will have 14 days to either accept the disbursement in full or a partial portion of the funds. If the student or parent does not respond to the notice in a timely manner, Title IV funds will be returned to the appropriate program. If authorization is received from the student or parent, funds will be disbursed within 120 days.

If grant funds are in the post-withdrawal disbursement, the School will retain the funds without the student's permission for current tuition and fees. If no current tuition and fees are due, the School will send the student the post withdrawal disbursement of grant funds. If the student has other outstanding charges, the School will notify the student of the charges before sending the student any grant funds. Any excess Grant funds will be disbursed to the student within 45 days.

If loan funds are in the post-withdrawal disbursement the School will notify the student, or parent in case of a PLUS loan, of the amount of current tuition and fees and/or outstanding charges due the School and the amount, if any that can be returned to the student or parent. A post withdrawal disbursement of loan funds will not be released to the student or parent unless they authorize current tuition and fees be paid first. If the student or parent declines the loan funds, no loan funds will be applied to current tuition and fees.

### REFUND TIME LINE AND REFUND ALLOCATION-TITLE IV

Any monies due the applicant or student shall be refunded within 45 days of the date that the School determines the student has withdrawn. The date of School determinations shall be the date of formal cancellation by the student or no more than 14 days from the last date of physical attendance. In the case of a student who does not return from an approved leave of absence, the School determination date shall be the earlier of the date of expiration of the leave of absence or the date the student notifies the institution that the student will not be returning.

Refunds will be returned in the following order:

1. Unsubsidized Federal Direct Loans
2. Subsidized Federal Direct Loans
3. Federal PLUS Loans/Direct PLUS Loans
4. Federal Pell Grant Program
5. Federal SEOG Program
6. Other Title IV Programs
7. Other Federal, State, Private or Institutional Assistance
8. The Student

By signing the enrollment agreement, the student authorizes the institution to retain any amount of the refund that would be allocated to Title IV, HEA loan programs. Please be advised that this is only the Return to Title IV refund. Once the school determines the amount of Title IV aid that the school may retain the institution will then calculate the institutional/state/accreditation agencies refund policy.

The information in this supplement is true and correct to the best of my knowledge.



Executive Director



1911 Antoine Drive, Houston, Texas 77055  
 (713) 683-3817 Fax (713) 683-7077

## BLOCK EQUIPMENT LIST

<u>EQUIPMENT</u>	<u>MODEL</u>	<u>MANUFACTURER</u>	<u>QUANTITY</u>
Cylinder Hone	CK-10	Sunnen	1
Boring Bar	F2B	Rottler	1
Balancer	DCB-750	Sunnen	1
Dynamometer	SF902	SuperFlow	1
8 Channel Wide Band 02	WEGA III	Daytona Sensors	1
Blow-By Flow Meter	VF-563	J-TEC	1
Chassis Dynamometer	248X	DynoJet	1
Horizontal Hone	CH-100-K	Sunnen	1
CNC Cylinder Hone	H75X	Rottler	1
Boring Bar	F9A	Rottler	1
Balancer	DCB-750	Sunnen	1
Cap Grinder	6200 HD	Delta	1
Cylinder Hone	SV-10	Sunnen	1
(with all popular torque plates)		BHJ	25
Align Hone	CH-100	Sunnen	1
Align Bore	PLB-100	Sunnen	1
Rod Machine (Manual)	LBB-1699	Sunnen	1
Surfacer	HBS-2100	Sunnen	1
Vertical Mill	JTM-4VS	JET	1
Lathe		Colchester	1
Press	BP-10	Sunnen	2
Press	HP-15	JET	1
Welder	PT 275	Lincoln Electric (TIG)	2
Welder	Handler 135	Hobart (MIG)	1
Block-Tru		BHJ	1
Lifter-Tru (SB,BB,LS)		BHJ	1
Rod Bushing Fixture		BHJ	1
Power Ring Filer	PRF-812DW	Total Seal	1
Rod Heater	CRH-50	Sunnen	1
Cap Grinder	LGR-750	Sunnen	2



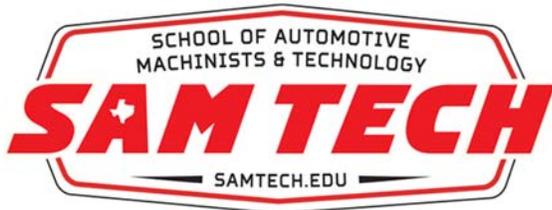
1911 Antoine Drive, Houston, Texas 77055  
 (713) 683-3817 Fax (713) 683-7077

### BLOCK EQUIPMENT LIST

<u>EQUIPMENT</u>	<u>MODEL</u>	<u>MANUFACTURER</u>	<u>QUANTITY</u>
Setting Fixture	CF-1000	Sunnen	3
Piston Jig	Vuasa		1
Drill Press	Rockwell		1
Rod Aligner	RI	Tobin ARP	1
Rod Aligner	TN-11	Sunnen	1
Crankshaft Polisher	PCP-1070	Goodson	1
Dial Bore Gage	GR-2000	Sunnen	7
Precision Gage	AG-300	Sunnen	3
Tool Sharpener	TS-100	Sunnen	1
Magna Flux	Y-6	Magna Flux	1
Profilometer	SJ-210	Mitutoyo	1
Camshaft Analyzer	Cam Doctor	Quadrant Scientific	1
Camshaft Software		Audie Technology	1
Computer Software		Engine Expert	1
Computer Software		Windyn	2
Parts Washer		Safety Kleen	
Internet Access			

\*Equipment used in Block & Cylinder Head Machining

\*Equipment used in Associates of Applied Science Degree in Block & Cylinder Head Machining



1911 Antoine Drive, Houston, Texas 77055  
 (713) 683-3817 Fax (713) 683-7077

### CYLINDER HEAD EQUIPMENT LIST

<u>EQUIPMENT</u>	<u>MODEL</u>	<u>MANUFACTURER</u>	<u>QUANTITY</u>
Flow Bench (with Flow Com, Swirl Meter, & Port Flow Analyzer v 3.0 Software)	SF1020	SuperFlow	1
Flow Bench (with Flow Com, Swirl Meter, & Port Flow Analyzer v 3.0 Software)	SF600	SuperFlow	1
Surfacer	HBS-2100D	Sunnen	1
Seat & Guide Machine	SG9MTS	Rottler	1
Seat & Guide Machine	VGS-20C	Sunnen	2
Valve Refacer	VR7000	Sunnen	1
Valve Guide Honing Set	P-190	Sunnen	2
Valve Guide Honing Stand	HS-60	Sunnen	1
Drill Press		Rockwell	1
Spring Tester	Bench Pro	Buxton Engineering	1
Guide Gage Set	P-310	Sunnen	2
Pressure Tester		AXE Equipment	1
Magna Flux	Y-6	Magna Flux	1
Seat Runout Gauge	VS1005	Sunnen	1
Lathe		Colchester	1
Welder	Handler 135	Hobart (MIG)	1
Welder	PT275	Lincoln Electric (TIG)	2
Sonic Tester	PR-8	Dakota Ultrasonics	1
Tool Sharpener	TS-100	Sunnen	1

\*Equipment used in Block & Cylinder Head Machining

\*Equipment used in Associates of Applied Science Degree in Block & Cylinder Head Machining



1911 Antoine Drive, Houston, Texas 77055  
 (713) 683-3817 Fax (713) 683-7077

### CNC MACHINING EQUIPMENT LIST

<u>EQUIPMENT</u>	<u>MODEL</u>	<u>MANUFACTURER</u>	<u>QUANTITY</u>
5 Axis CNC Machining Center	ES-5-4T	Haas	1
3 Axis CNC Mill	V11	Takumi	1
Rotary Table	HRT-210	Haas	1
8" 3-Jaw Chuck	LC8-B	Haas	1
Control Simulator Module	CSMD	Haas	2
7-Axis Measurement Arm 8ft. w/ Bluetooth	FaroArm Platinum	Faro	1
Laser Line Probe	V3	Faro	1
Portable Tripod	ACCS0134	Faro	1
Granite Rolling Cart	ACCS0164	Faro	1
Student Computer	Precision 5820	Dell	20
Computer Software	Basic System	Verisurf	1
Computer Software	Reverse Module	Verisurf	1
Computer Software	X7 Multi-Axis	Mastercam	20



1911 Antoine Drive, Houston, Texas 77055  
 (713) 683-3817 Fax (713) 683-7077

## **EFI CALIBRATION EQUIPMENT LIST**

<b><u>EQUIPMENT</u></b>	<b><u>MODEL</u></b>	<b><u>MANUFACTURER</u></b>	<b><u>QUANTITY</u></b>
Dynamometer	SF902	SuperFlow	1
8 Channel Wide Band 02	WEGA III	Daytona Sensors	8
Knock Monitor	v2.0	Plex Tuning	1
Blow-By Flow Meter	VF-563	J-TEC	1
Chassis Dynamometer	248X	DynoJet	1
OEM LS3	LS3	Chevrolet	2
Camshafts	N/A	N/A	N/A
Cylinder Heads	N/A	N/A	N/A
Holley EFI	554-114	Holley	1
Wiring Harness	N/A	N/A	3
2010 Camaro	Camaro	Chevrolet	1
1999 Camaro	Camaro	Chevrolet	1
2014 Mustang	Mustang	Ford	
2013 COPO	COPO	Chevrolet	1
2012 COPO	COPO	Chevrolet	1
1957 Bel Air	Bel Air	Chevrolet	1
HP Tuners Interface	N/A	HP Tuners	1
Tuner Suite	N/A	HP Tuners	1
Laptop	3450	Dell	1
Engine Run Stand		Holley	1
<b><u>STUDENT EQUIPMENT</u></b>			
Laptop	3450	Dell	1
HP Tuners Interface	N/A	HP Tuners	1
Tuner Suite	N/A	HP Tuners	1